

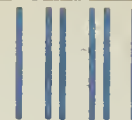
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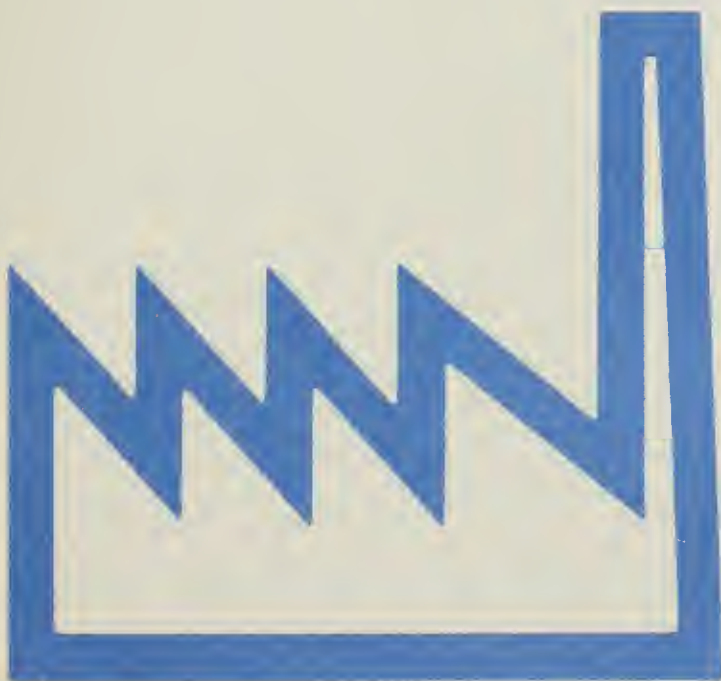
Census of Manufactures

MC82-1-35C

INDUSTRY SERIES

Metalworking Machinery and Equipment

Industries 3541, 3542, 3544, 3545, 3546, 3547, and 3549



The publications
from the 1982 Economic and
Agriculture Censuses are dedicated
to the memory of Shirley Kallek,
Associate Director for Economic Fields.
During her career at the Bureau of the
Census (1955 to 1983), she continually
directed efforts to improve
the timeliness and accuracy of
economic statistics.

1982 Census of Manufactures

MC82-I-35C

INDUSTRY SERIES

Metalworking Machinery and Equipment

- 3541 Machine Tools, Metal Cutting Types
 - 3542 Machine Tools, Metal Forming Types
 - 3544 Special Dies, Tools, Jigs, and Fixtures
 - 3545 Machine Tool Accessories
 - 3546 Power Driven Hand Tools
 - 3547 Rolling Mill Machinery
 - 3549 Metalworking Machinery, N.E.C.
-

Issued March 1985



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INDUSTRY DIVISION
Gaylord E. Worden, Chief

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INTRODUCTION

ECONOMIC CENSUSES OVER TIME

The early beginnings of America's industrial output were first measured in the United States in the 1810 Decennial Census and again in 1820, when questions on manufacturing were included with those for population. Beginning with the 1840 Decennial Census, there were enumerations of manufactures and mineral industries at 10-year intervals up to and including the year 1900 for manufactures and 1940 for mineral industries. The latter census was again taken for 1954, 1958, 1963, and 1967.

Because of the increasing dominance of manufacturing in the early 20th century, Congress directed that quinquennial censuses of manufactures be taken beginning in 1905. However, from 1919 through 1939, these censuses were conducted every 2 years. The need for war-related current surveys in the early 1940's postponed the next census of manufactures until 1948 (for 1947). That census was again taken for 1954, 1958, 1963, and 1967.

Retail and wholesale trade data were first collected in 1930, and in 1933 information on selected service industries was added to the data-collection operation. These business censuses, as they were called, were again taken for 1935, 1939 (as part of the 1940 decennial program), 1948, 1954, 1958, 1963, and 1967.

Information on construction industries was obtained first in 1930 and again for 1935 and 1939. Data for the full spectrum of construction industries were not gathered again until 1968 (for 1967).

The need for transportation data to supplement information available from existing governmental or private sources was recognized by Congress in the late 1950's and early 1960's. The census of transportation (consisting of several surveys) was taken first for 1963 and again for 1967.

Since 1967, all of the above censuses have been taken quinquennially as part of the Census Bureau's economic census program. (For the 1977 censuses, the coverage of the service industries was broadened from "selected services" to "all services, except religious organizations and private households." A total of 41 additional four-digit standard industrial classifications¹ (SIC's) in 7 SIC major groups was added to the scope of the census. While most of the industries included for the first time for 1977 were covered again for 1982, some were not, i.e., hospitals; elementary and secondary schools; colleges, universities, and professional schools; junior colleges and technical institutes; labor unions and similar labor organizations; and political organizations.)

The first manufacturing census for an outlying area was conducted in Puerto Rico for the year 1909. Thereafter, with the exception of 1929, a census was taken at 10-year intervals through 1949. The first censuses of retail trade, wholesale trade, and selected service industries in Puerto Rico were conducted for 1939. These censuses also were taken for the years 1949, 1954, 1958, 1963, and 1967. A census of construction industries was introduced first in Puerto Rico for 1967. These censuses of Puerto Rico have been taken since then for the years 1972, 1977, and 1982.

Censuses of manufactures, retail trade, wholesale trade, and selected service industries were conducted in Guam and the

Virgin Islands of the United States for 1958, 1963, 1967, 1972, 1977, and 1982. Censuses of mineral industries were taken in the Virgin Islands of the United States for the years 1958, 1963, and 1967 but not since that time. A census of construction industries was also undertaken in these areas for 1972, 1977, and 1982.

Retail trade, wholesale trade, selected service industries, manufacturing, and construction industries were canvassed for the first time in the Northern Mariana Islands in 1983 (for 1982).

For 1982, the economic censuses and agriculture censuses were conducted concurrently.

USES OF THE ECONOMIC CENSUSES

The economic censuses are the major source for facts about the structure and functioning of the Nation's economy and provide essential information for government, business, industry, and the general public. They provide an important part of the framework for such composite measures as the gross national product, input-output measures, indexes of industrial production, and indexes measuring productivity and price levels. Information from the censuses is used to establish sampling frames and as benchmarks for current surveys of business activity, which are essential for measuring short-term economic conditions.

State and local governments use census data to assess business activities within their jurisdictions. The private sector uses the data to forecast general economic conditions; analyze sales performance; lay out sales territories; allocate funds for advertising; decide on locations for new plants, warehouses, or stores; and measure potential markets in terms of size, geographic areas, kinds of business, and kinds of products made or sold.

Following every census, thousands of businesses and other users purchase reports. Likewise, census facts are disseminated widely by trade associations, business journals, and newspapers. Volumes containing census statistics are available in most major public and college libraries. All 1982 data are available on microfiche from the U.S. Government Printing Office and most data on computer tape from the Census Bureau. Finally, the more than 50 State Data Centers also are suppliers of economic census statistics.

AUTHORITY AND SCOPE OF THE ECONOMIC CENSUSES

The economic censuses are required by law under title 13 of the United States Code, sections 131, 191, and 224, which directs that they be taken at 5-year intervals for the years ending in 2 and 7. The 1982 Economic Censuses covered manufacturing, mining, construction industries, retail trade, wholesale trade, service industries, and selected transportation activities. Special programs also cover minority-owned and women-owned businesses. The next economic censuses are scheduled to be taken in 1988 for the year 1987.

¹Standard Industrial Classification Manual: 1972. For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 041-001-00066-6. 1977 Supplement. Stock No. 003-00500176-0.

CENSUS OF MANUFACTURES

General

The 1982 Census of Manufactures is the 31st census of manufactures of the United States. For 1982, it was conducted jointly with the censuses of mineral industries, construction industries, retail and wholesale trades, service industries, selected transportation activities, and minority-owned and women-owned businesses.

This report, from the 1982 Census of Manufactures, is one of a series of 82 industry reports, each of which provides statistics for groups of related industries. Additional separate reports will be issued for each State and on special subjects, such as size of establishments, legal form of organization, and fuels and electric energy consumed.

These separate reports will subsequently be issued as portions of the final census volumes. Volume I, Subject Statistics, will show comparative statistics for industries, States, and standard metropolitan statistical areas. It also will show selected subjects, such as concentration ratios in manufacturing, selected materials consumed, manufacturing activity in government establishments, and water use in manufacturing. Volume II, Industry Statistics, will be a consolidation of reports for the 82 groups of industries showing the same information that is shown in this report. Volume III, Geographic Area Statistics, will contain establishment-based data (number of establishments, employment, payroll, value added by manufacture, and capital expenditures) for each State and its important standard metropolitan statistical areas, counties, and places, by industry groups and important individual industries. Totals for "all manufacturing" will be shown for counties and places with more than 450 manufacturing employees. The introduction to the final volumes will discuss, at greater length, many of the subjects described in this introduction. For example, the volume text will discuss the relationship of value added by manufacture to National income by industry of origin, the changes in statistical concepts over the history of the censuses, and the valuation problems arising from intracompany transfers between manufacturing plants of a company and between manufacturing plants and sales offices and sales branches of a company.

Scope of Census and Definition of Manufacturing Industries

The 1982 Census of Manufactures covers all establishments employing one person or more primarily engaged in manufacturing as defined in the 1972 Standard Industrial Classification (SIC) Manual and its 1977 Supplement.¹ This is the system of industrial classification developed over a period of years by experts on classification in government and private industry under the guidance of the Office of Management and Budget. This system of classification is in general use among government agencies as well as organizations outside the government.

The SIC manual defines manufacturing as the mechanical or chemical transformation of inorganic or organic substances into new products. The assembly of component parts of products is also considered to be manufacturing if the resulting product is neither a structure nor other fixed improvement. These activities are usually carried on in plants, factories, or mills that characteristically use power-driven machines and materials handling equipment.

¹Standard Industrial Classification Manual: 1972. For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 041-001-00066-6. 1977 Supplement. Stock No. 003-00500176-0.

IV INTRODUCTION

Manufacturing production is usually carried on for the wholesale market, for transfers to other plants of the same company, or to the order of industrial users rather than for direct sale to the household consumer. Some manufacturers in a few industries sell chiefly at retail to household consumers through the mail, through house-to-house routes, or through salespersons. Some activities of a service nature (enameling, engraving, etc.) are included in manufacturing when they are performed primarily for the trade. They are considered nonmanufacturing when they are performed primarily to the order of the household consumer.

Relationship Between Annual Survey of Manufactures and Census of Manufactures

The Bureau of the Census conducts the annual survey of manufactures (ASM) in each of the 4 years between the censuses of manufactures. The ASM is based on a scientifically selected sample of approximately 55,000 establishments and collects the same industry statistics (employment, payroll, value of shipments, etc.) as the census of manufactures. In addition to collecting the information normally requested on the census form, the establishments in the ASM sample are requested to supply detailed information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, and costs of purchased services.

Establishment Basis of Reporting

The census of manufactures and the annual survey of manufactures are conducted on an establishment basis. A company operating at more than one location is required to file a separate report for each location. Companies engaged in distinctly different lines of activity at one location are requested to submit separate reports if the plant records permit such a separation and if the activities are substantial in size.

In 1982, as in earlier years, a minimum size limit was set for including establishments in the census. All establishments employing one person or more at any time during the census year are included. The same size limitation has applied since 1947 in censuses and annual surveys of manufactures. In the 1939 and earlier censuses, establishments with less than \$5,000 value of products were excluded. The change in the minimum size limit in 1947 does not appreciably affect the historical comparability of the census figures except for data on number of establishments for a few industries.

This report excludes information for separately operated administrative offices, warehouses, garages, and other auxiliary units that service manufacturing establishments of the same company (see Auxiliaries).

Manufacturing Universe and Census Report Forms

The 1982 Census of Manufactures universe includes approximately 345,000 establishments. The amounts of information requested from manufacturing establishments were dependent upon a number of factors. The more important considerations were the size of the company and whether it was included in the annual survey of manufactures. The methods of obtaining information for the various subsets of the universe to arrive at the aggregate figures shown in this publication are described below.

1. Small Single-Unit Companies Not Sent a Report Form

In the 1982 Census of Manufactures, approximately 140,000 small single-establishment companies were excused from filing reports. Selection of these small

establishments was done on an industry-by-industry basis and was based on annual payroll and total shipments data as well as on the industry classification codes contained in the administrative records of other Federal agencies. The cutoffs were selected so that these administrative records cases would account for no more than 3 percent of the value of shipments for the industry. Generally, all single-establishment companies with less than 5 employees were excused, while all establishments with more than 20 employees were mailed report forms.

Information on the physical location of the establishment, as well as information on payrolls, receipts (shipments), and industry classification, was obtained from the administrative records of other Federal agencies under special arrangements, which safeguarded their confidentiality. Estimates of data for these small establishments were developed using industry averages in conjunction with the administrative information. The value of shipments and cost of materials were not distributed among specific products and materials for these establishments but were included in the product and material "not specified by kind" (n.s.k.) categories.

The industry classification codes included in the administrative records files were assigned on the basis of brief descriptions of the general activity of the establishment. As a result, an indeterminate number of establishments were erroneously coded to the four-digit SIC level. This was especially true whenever there was a relatively fine line of demarcation between industries or between manufacturing and nonmanufacturing activity.

Sometimes these administrative record cases were given only a two- or three-digit SIC group. For the 1982 Census of Manufactures, these establishments were sent a separate classification form, which requested information on the products and services of the establishment. This form was used to code many of these establishments to the four-digit SIC level. Establishments that did not return the classification form were coded later to those four-digit SIC industries identified as "not elsewhere classified" (n.e.c.) within the given two- or three-digit industry groups.

As a result of these situations, a number of small establishments may have been misclassified by industry. However, such possible misclassifications have no significant effect on the statistics other than on the number of establishments.

The total establishment count for individual industries should be viewed as an approximation rather than a precise measurement. The counts for establishments with 20 employees or more are far more reliable than the count of total number of establishments.

2. Establishments Sent a Report Form

The 205,000 establishments covered in the mail canvass were divided into three groups:

a. ASM sample establishments—This group consisted of approximately 55,000 establishments covering all the units of large manufacturing establishments as well as a sample of the medium and smaller establishments. The probability of selection was proportionate to size (see appendix, Annual Survey of Manufactures).

In a census of manufactures year, the ASM report form (MA-1000) replaces the first page of the regular census form for those establishments included in the ASM. In addition to information on employment, payroll,

and other items normally requested on the regular census form, establishments in the ASM sample were requested to supply information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, and costs of purchased services. Results of the ASM inquiries are included in tables 3c and 3d of this report.

The census part of the report form is one of approximately 200 versions containing product, material, and special inquiries. The diversity of manufacturing activities necessitated the use of this many forms to canvass the approximately 450 manufacturing industries. Each form was developed for a group of related industries.

Appearing on each form was a list of products primary to the group of related industries, as well as secondary products and miscellaneous services that establishments classified in these industries were likely to be performing. Respondents were requested to identify the products, the value of each product, and, in a large number of cases, the quantity of the product shipped during the survey year. Space was also provided for the respondent to describe products not specifically identified on the form.

The report form also contained a materials-consumed inquiry, which varied from form to form depending on the industries being canvassed. The respondents were asked to review a list of materials generally used in their production processes. From this list, each establishment was requested to identify those materials consumed during the survey year, the cost of each, and, in certain cases, the quantity consumed. Once again, space was provided for the respondent to describe significant materials not identified on the form.

Finally, a wide variety of special inquiries was included to measure activities peculiar to a given industry, such as operations performed and equipment used.

b. Large and medium establishments (non-ASM)—Approximately 100,000 establishments were included in this group. A variable cutoff, based on administrative records payroll data and determined on an industry-by-industry basis, was used to select those establishments that were to receive one of the approximately 200 census of manufactures regular forms. The first page, requesting establishment data for items such as employment and payroll, was standard but did not contain the detailed statistics included on the ASM form. The product, material, and special inquiry sections supplied were based on the historical industry classification of the establishment.

c. Small single-unit establishments (non-ASM)—This group consisted of approximately 50,000 establishments. For those industries where application of the variable cutoff for administrative records cases resulted in a large number of small establishments being included in the mail canvass, an abbreviated or "short" form was used. These establishments received one of the approximately 80 versions of the short form, which requested summary product and material data and totals but no details on employment, payrolls, cost of materials, inventories, and capital expenditures.

Use of the short form has no adverse effect on published totals for the industry statistics; the same

data were collected on the short as well as the long form. However, detailed information on materials consumed was not collected on the short form; thus its use would increase the values of the n.s.k. categories.

Auxiliaries

In this industry report, the data on employment and payroll are limited to operating manufacturing establishments. The census report form filed for auxiliaries (ES-9200) requested a description of the activity of the establishments serviced. However, the auxiliaries were coded only to the two-digit major group of the establishments they served; whereas, the operating establishments were coded to a four-digit manufacturing industry. Data for the approximately 10,000 separately operated auxiliaries are included in the paperbound geographic area series, the bound volumes of the census of manufactures, and in a report issued as part of the 1982 Enterprise Statistics survey.

Auxiliaries are establishments whose employees are primarily engaged in performing supporting services for other establishments of the same company, rather than for the general public or for other business firms. They can be at different locations from the establishments served or at the same location as one of those establishments but not operating as an integral part thereof and serving two or more establishments. Where auxiliary operations are conducted at the same location as the manufacturing operation and operate as an integral part thereof, they usually are included in the report for the operating manufacturing establishment.

Included in the broad category of auxiliaries are administrative offices. Employees in administrative offices are concerned with the general management of multiestablishment companies, i.e., with the general supervision and control of two units or more, such as manufacturing plants, mines, sales branches, or stores. The functions of these employees may include (1) program planning, including sales research and coordination of purchasing, production, and distribution; (2) company purchasing, including general contracts and purchasing methods; (3) company financial policy and accounting, tax accounting, company sales and profit reports, and personnel accounting; (4) general engineering, including design of product machinery and equipment, and direction of engineering effort conducted at the individual operation locations; (5) direction of company personnel matters; and (6) legal and patent matters.

Other types of auxiliaries serving the plants or central management of the company include purchasing offices, sales promotion offices, research and development organizations, etc.

Industry Classification of Establishments

Each of the establishments covered in the census was classified in one of approximately 450 manufacturing industries in accordance with the industry definitions in the SIC system. Under this system of classification, an industry is generally defined as a group of establishments producing a single product or a closely related group of products. The product groupings from which industry classifications are derived are based on considerations such as similarity of manufacturing processes, types of materials used, types of customers, and the like. The resulting group of plants must be significant in terms of its number, value added by manufacture, value of shipments, and number of employees. The system operates in such a way that the definitions progressively became narrower with successive additions of numerical digits. There are 20 major groups (two-digit SIC), 143 industry groups (three-digit SIC), and approximately 450

industries (four-digit SIC). The product classes and products of the manufacturing industries have been assigned codes based on the industry from which they originate. There are about 1,500 classes of products, identified by a five-digit code, and about 11,000 products, identified by a seven-digit code. The seven-digit products are considered the primary products of the industry with the same four digits.

Accordingly, an establishment is usually classified in a particular industry on the basis of its major activity during a particular year, i.e., production of the products primary to that industry exceeds, in value, production of the products primary to any other single industry. In a few instances, however, the industry classification of an establishment is not only determined by the products it makes but also by the process employed in making those products. For example, establishments engaged in blast furnace operations, refining of nonferrous metals from ore, or rolling and drawing of nonferrous metals (processes which involve heavy capitalization in specialized equipment) would be classified according to the process used during a census year. These establishments then would be "frozen" in that industry during the following ASM years.

In either a census or ASM year, establishments included in the ASM sample with certainty weight, other than those involved with heavily capitalized activities described above, are reclassified by industry only if the change in the primary activity from the prior year is significant or the change has occurred for two successive years. This procedure prevents reclassification when there are minor shifts in product mix.

In ASM years, establishments included in the ASM sample with noncertainty weight are not shifted from one industry classification to another. They are retained in the industry where they were classified in the base census year (see appendix, Annual Survey of Manufactures). However, in the following census year, these ASM plants are allowed to shift from one industry to another.

The result of these rules covering the switching of plants from one industry classification to another is that, at the aggregate level, some industries comprise different mixes of establishments between survey years, and establishment data for such industry statistics as employment and payroll may be tabulated in different industries between survey years. Hence, comparisons between prior-year and current-year published totals, particularly at the four-digit SIC level, should be viewed with caution. This is true particularly for the comparison between the data shown for a census year versus the data shown for the previous ASM year.

As previously noted, the small establishments that may have been misclassified by industry are usually administrative-record cases whose industry codes were assigned on the basis of incomplete descriptions of the general activity of the establishment. Such possible misclassifications have no significant effect on the statistics other than on the number of establishments.

While some establishments produce only the primary products of the industry in which they are classified, all establishments of an industry rarely specialize to this extent. The industry statistics (employment, inventories, value added by manufacture, total value of shipments including resales and miscellaneous receipts, etc.) shown in tables 1a through 5a, therefore, reflect not only the primary activities of the establishments in that industry but also their secondary activities. The product statistics in tables 6a through 6c represent the output of all establishments whether or not they are classified in the same industry as the product. For this reason, in relating the industry statistics, especially the value of shipments to the product statistics, the

composition of the industry's output shown in table 5b should be considered.

The extent to which industry and product statistics may be matched with each other is measured by two ratios, which are computed from the figures shown in table 5b. The first of these ratios, called the primary product specialization ratio, measures the proportion of product shipments (both primary and secondary) of the establishments classified in the industry represented by the primary products of those establishments. The second ratio, called the coverage ratio, is the proportion of primary products shipped by the establishments classified in the industry to total shipments of such products by all manufacturing establishments.

However, establishments making products falling into the same industry category may use a variety of processes and materials to produce them. Also, the same industry classification (based on end products) may include both establishments that are highly integrated and those that put only the finishing touches on an already highly fabricated item. For example, the refrigeration industry includes instances of almost complete integration (production of the compressor, condensing unit, electric motor, casting, stamping of the case, and final assembly) all carried on at one plant. On the other hand, the condensing unit, the motor, and the case may be purchased and only assembled into the finished product.

In some instances, separate industry categories have been established for integrated and nonintegrated establishments. For other industries, the census provides separate statistics on the production of intermediate commodities made and used in the producing plant. For some industries characterized by many plants of the same company, separate figures on interplant transfer of products usually are shown.

Differences in the integration of production processes, types of operations, and alternatives in types of materials used should be considered when relating the industry statistics (employment, payrolls, value added, etc.) to the product and material data.

Value of Shipments for the Industry Compared With Value of Product Shipments

This industry report shows value of shipments data for industries and products. In tables 1a through 5a, these data represent the total value of shipments of all establishments classified in a particular industry. The data include the shipments of the products classified in the industry (primary to the industry), products classified in other industries (secondary to the industry), and miscellaneous receipts (repair work, sale of scrap, research and development, installation receipts, and resales). Product shipments shown in table 6a represent the total value of shipments of products classified as primary to an industry that were shipped by all manufacturing establishments regardless of their industry classification.

CENSUS DISCLOSURE RULES

In accordance with Federal law governing census reports, no data are published that would disclose the data for an individual establishment or company. However, the number of establishments classified in a specific industry is not considered a disclosure, so this item may be given even though other information is withheld.

MANUFACTURES—INDUSTRY SERIES

The disclosure analysis for the industry statistics in tables 1a through 5a of this report is based on the total value of shipments. When the total value of shipments cannot be shown without disclosing information for individual companies, the complete line has been suppressed. However, the suppressed data are included in higher level totals. Additional disclosure analysis is performed for new capital expenditures that can be suppressed even though value of shipments data are publishable.

MICROFICHE AND COMPUTER TAPES

All the data in this report are available on microfiche. Selected data are also available on computer tape.

In addition to selected published data being on computer tape, one major data series, the location of manufacturing plants, will be available only on computer tape. This series presents the number of establishments by employment size class by four-digit SIC industry codes for States, counties, and places of 2,500 inhabitants or more. These data are available for both State and county by industry, and State and place by industry.

Microfiche reports are sold by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Computer tapes are sold by the Data User Services Division, Customer Services (Tapes), Bureau of the Census, Washington, D.C. 20233.

SPECIAL TABULATIONS

Special tabulations of data collected in the 1982 Census of Manufactures may be obtained on computer tape or in tabular form. The data will be in summary form and subject to the same rules prohibiting disclosure of confidential information (including name, address, kind of business, or other data for individual business establishments or companies) as are the regular publications.

Special tabulations are prepared on a cost basis. A request for a cost estimate, as well as exact specifications on the type and format of the data to be provided, should be directed to the Chief, Industry Division, Bureau of the Census, Washington, D.C. 20233.

ABBREVIATIONS AND SYMBOLS

The following abbreviations and symbols are used in this publication:

- Represents zero.
- (D) Withheld to avoid disclosing data for individual companies; data are included in higher level totals.
- (NA) Not available.
- (NC) Not comparable.
- (S) Withheld because estimate did not meet publication standards on the basis of either the response rate or a consistency review.
- (X) Not applicable.
- (Z) Less than half the unit shown.
- n.e.c. Not elsewhere classified.
- n.s.k. Not specified by kind.
- pt. Part.
- r Revised.
- SIC Standard Industrial Classification.

Other abbreviations, such as lb, gal, yd, doz, bbl, and s tons, are used in the customary sense.

Users' Guide for Locating Statistics

[For explanation of terms, see appendixes]

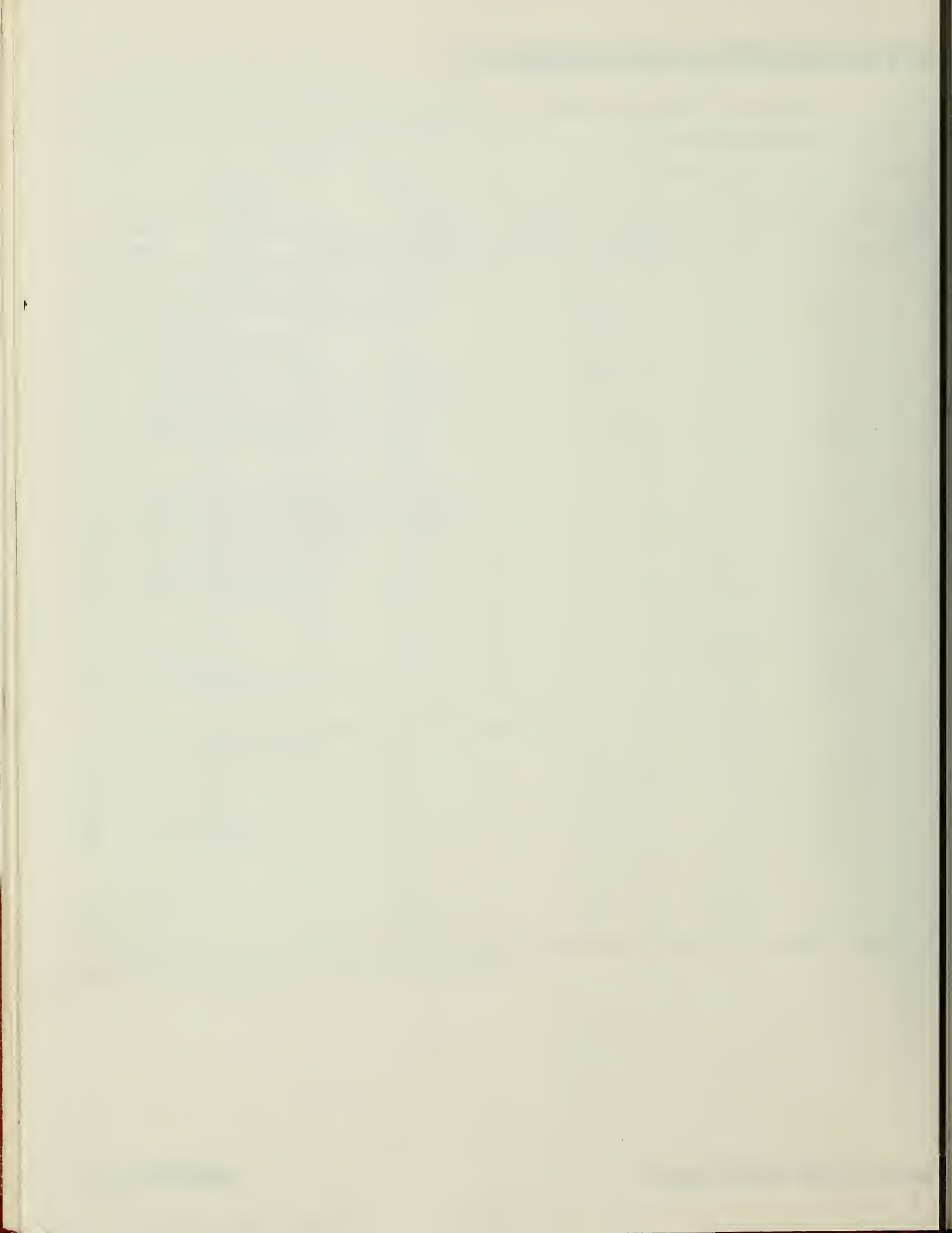
	Item	Four-digit industry statistics		
		Historical	Operating ratios	By geographic area
1	Number of companies	1a		
2	Number of manufacturing establishments	1a		2
	Employment and payroll:			
3	Number of employees	1a	1b	2
4	Payroll	1a	1b	2
5	Supplemental labor costs			
6	Production workers	1a	1b	2
7	Production-worker hours	1a	1b	2
8	Production-worker wages	1a	1b	2
	Shipments, cost of materials, and value added:			
9	Value of shipments (four-digit)	1a	1b	2
10	Product class shipments (five-digit)			
11	Product shipments (seven-digit)			
12	Value added by manufacture	1a	1b	2
13	Cost of materials	1a	1b	2
14	Fuels and electric energy			
15	Materials consumed by kind			
	Inventories:			
16	Total, end of year	1a		
17	By method of valuation			
18	By stage of fabrication			
	Capital expenditures, assets, rental payments, and purchased services:			
19	New capital expenditures	1a		2
20	Used plant and equipment expenditures			
21	Gross assets			
22	Depreciation			
23	Retirements of buildings and machinery			
24	Rental payments			
25	Purchased services			
	Ratios:			
26	Specialization	1a		
27	Coverage	1a		

*Number of companies with shipments of over \$100 thousand.

**Detailed information shown.

in This Report by Table Number

Four-digit industry statistics—Con.				Five-digit product class and seven-digit product statistics				
Summary and supplemental	By employment size	By industry and product class specialization	Materials consumed by kind	Industry-product analysis	Product shipments	Product class by geographic area	Historical product class	
3a					* 6a			1
** 3a	4	5a						2
3a	4	5a						3
3a	4	5a						4
** 3d								5
** 3a	4	5a						6
** 3a	4	5a						7
3a	4	5a						8
3a	4	5a		5b, 5c				9
				5b, 5c	6a	6b	6c	10
					6a			11
3a	4	5a						12
** 3a	4	5a						13
3a, 3d			7					14
								15
3b, 3c	4							16
3b, 3c								17
3b								18
** 3a, ** 3d	4	5a						19
** 3a, ** 3d								20
** 3d								21
** 3d								22
** 3d								23
** 3d								24
** 3d								25
3a				5b				26
3a				5b				27



Metalworking Machinery and Equipment

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DESCRIPTION OF INDUSTRIES AND SUMMARY OF FINDINGS

METALWORKING MACHINERY AND EQUIPMENT

This report shows 1982 Census of Manufactures statistics for establishments classified in each of the following industries:

SIC Code and Title

3541	Machine Tools, Metal Cutting Types
3542	Machine Tools, Metal Forming Types
3544	Special Dies, Tools, Jigs, and Fixtures
3545	Machine Tool Accessories
3546	Power Driven Hand Tools
3547	Rolling Mill Machinery
3549	Metalworking Machinery, N.E.C.

The industry statistics (employment, payroll, cost of materials, value of shipments, inventories, etc.) are reported for each establishment as a whole. Aggregates of such data for an industry reflect not only the primary activities of the establishments but also their activities in the manufacture of secondary products as well as their miscellaneous activities (contract work on materials owned by others, repair work, etc.). This fact should be taken into account in comparing industry statistics (tables 1a-5a) with product statistics (table 6a) showing shipments by all industries of the primary products of the specified industry. The extent of the "product mix" is indicated in table 5b, which shows the value of primary and secondary products shipped by establishments classified in the specified industry and the value of primary products of the industry shipped as secondary products by establishments classified in other industries.

Small single-unit companies with up to 20 employees (cutoff varied by industry) were excluded from the mail portion of the census. For these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated), data on payrolls and receipts were obtained from administrative records of other government agencies. The remaining statistics were developed from industry averages.

Establishment data were tabulated based on industry definitions contained in the 1972 Standard Industrial Classification (SIC) Manual and its 1977 supplement.¹

INDUSTRY 3541, MACHINE TOOLS, METAL CUTTING TYPES

This industry comprises establishments primarily engaged in the manufacture of machines, not supported in the hands of an operator when in use, that shape metal by cutting or use of electrical techniques; the rebuilding of such machine tools; and the manufacture of replacement parts for them. Metalworking, or primarily metalworking, machine tools designed primarily for

home workshops are also included. Establishments primarily engaged in the manufacture of electric welding equipment are classified in industry 3623; portable power driven hand tools in industry 3546; and gas welding and cutting equipment and automotive maintenance equipment in industry 3549.

In the 1982 Census of Manufactures, Industry 3541, Machine Tools, Metal Cutting Types, recorded employment of 58.1 thousand. The total value of shipments for establishments classified in this industry was \$4,440 million.

The value of shipments figure shown above is in current (1982) prices. All dollar figures included in this report are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

The employment figure shown above was 2 percent below the 59.4 thousand reported in 1977. The leading States in employment in 1982 were Ohio, Michigan, Illinois, and Connecticut, accounting for approximately 55 percent of the industry's 1982 employment. This represents a shift from 1977 when Ohio, Michigan, Illinois, and New York accounted for approximately 60 percent of the industry's employment.

Compared with 1981, employment decreased 22 percent. The 1981 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. In current prices, industry 3541 shipped \$3,877 million of products primary to the industry, \$369 million of secondary products, and had \$194 million of miscellaneous receipts. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 91 percent (specialization ratio). In 1977, this specialization ratio was 87 percent.

Establishments in this industry also accounted for 93 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1977, the coverage ratio was 92 percent. The products primary to industry 3541, no matter in what industry they were produced, appear in table 6a and aggregate to \$4,155 million in current prices.

The total cost of materials and services used by establishments classified in the metal cutting machine tool industry amounted to \$1,590 million in current prices. Data on specific materials consumed appear in table 7.

The establishments in this industry with less than 10 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 6 percent of total value of shipments.

¹Standard Industrial Classification Manual: 1972. For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 041-001-00066-6. 1977 Supplement. Stock No. 003-005-00176-0.

INDUSTRY 3542, MACHINE TOOLS, METAL FORMING TYPES

This industry comprises establishments primarily engaged in the manufacture of machines, not supported in the hands of an operator while in use, for pressing, hammering, extruding, shearing, die casting, or otherwise forming metal into shape. This industry also includes rebuilding such machine tools and manufacturing repair parts for them. Establishments primarily engaged in the manufacture of electric welding equipment are classified in industry 3623, portable power driven hand tools in industry 3546; rolling mill machinery and equipment in industry 3547, and gas welding and cutting equipment and automotive maintenance equipment in industry 3549.

In the 1982 Census of Manufactures, Industry 3542, Machine Tools, Metal Forming Types, recorded employment of 19.5 thousand. The total value of shipments for establishments classified in this industry was \$1,429 million.

The value of shipments figure shown above is in current (1982) prices. All dollar figures included in this report are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

The employment figure shown above was 18 percent below the 23.7 thousand reported in 1977. The leading States in employment in 1982 were Ohio, Illinois, New York, and Michigan, accounting for approximately 62 percent of the industry's 1982 employment. These same States were the leaders in 1977, when they accounted for approximately 65 percent of the industry's employment, although there has been some shift in the relative importance of individual States.

Compared with 1981, employment decreased 19 percent. The 1981 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. In current prices, industry 3542 shipped \$1,210 million of products primary to the industry, \$144 million of secondary products, and had \$75 million of miscellaneous receipts. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 89 percent (specialization ratio). In 1977, this specialization ratio was 90 percent.

Establishments in this industry also accounted for 87 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1977, the coverage ratio also was 87 percent. The products primary to industry 3542, no matter in what industry they were produced, appear in table 6a and aggregate to \$1,384 million in current prices.

The total cost of materials and services used by establishments classified in the machine tool, metal forming types, industry amounted to \$575 million in current prices. Data on specific materials consumed appear in table 7.

The establishments in this industry with less than 10 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records

of other agencies or developed from industry averages. These establishments accounted for 10 percent of total value of shipments.

INDUSTRY 3544, SPECIAL DIES, TOOLS, JIGS, AND FIXTURES

This industry includes establishments commonly known as contract tool and die shops and primarily engaged in the manufacture of, on a job or order basis, special tools and fixtures for use with machine tools, hammers, die casting machines, and presses. The products of establishments classified in this industry include a wide variety of special toolings, such as dies; punches; die sets and components, and subpresses; jigs and fixtures; and special checking devices. Establishments primarily engaged in the manufacture of molds for die casting and foundry casting; metal molds for plaster working, rubber working, plastics working, glass working, and similar machinery are also included. Establishments primarily engaged in the manufacture of molds for heavy steel ingots are classified in industry 3321.

In the 1982 Census of Manufactures, Industry 3544, Special Dies, Tools, Jigs, and Fixtures, recorded employment of 102.9 thousand. The total value of shipments for establishments classified in this industry was \$5,375 million.

The value of shipments figure shown above is in current (1982) prices. All dollar figures included in this report are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

The employment figure shown above was 3 percent below the 105.7 thousand reported in 1977. The leading States in employment in 1982 were Michigan, Ohio, Illinois, and Pennsylvania, accounting for approximately 53 percent of the industry's 1982 employment. These same States were the leaders in 1977, when they accounted for approximately 55 percent of the industry's employment.

Compared with 1981, employment decreased 17 percent. The 1981 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. In current prices, industry 3544 shipped \$4,795 million of products primary to the industry, \$298 million of secondary products, and had \$282 million of miscellaneous receipts. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 94 percent (specialization ratio). In 1977, this specialization ratio also was 94 percent.

Establishments in this industry also accounted for 79 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1977, the coverage ratio was 79 percent. The products primary to industry 3544, no matter in what industry they were produced, appear in table 6a and aggregate to \$6,099 million in current prices.

The total cost of materials and services used by establishments classified in the special dies, tools, jigs, and fixtures industry amounted to \$1,535 million in current prices. Data on specific materials consumed appear in table 7.

The establishments in this industry with less than 10 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 19 percent of total value of shipments.

INDUSTRY 3545, MACHINE TOOL ACCESSORIES

This industry comprises establishments primarily engaged in the manufacture of cutting tools, machinists' precision measuring tools, and tools for other metalworking machinery, not elsewhere classified. Establishments primarily engaged in the manufacture of hand tools, except power driven types, are classified in industry group 342.

In the 1982 Census of Manufactures, Industry 3545, Machine Tool Accessories, recorded employment of 55.1 thousand. The total value of shipments for establishments classified in this industry was \$3,164 million.

The value of shipments figure shown above is in current (1982) prices. All dollar figures included in this report are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

The employment figure shown above was 2 percent above the 54.0 thousand reported in 1977. The leading States in employment in 1982 were Michigan, Ohio, Massachusetts, and Illinois, accounting for approximately 54 percent of the industry's 1982 employment. These same States were the leaders in 1977, when they accounted for approximately 60 percent of the industry's employment.

Compared with 1981, employment decreased 11 percent. The 1981 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. In current prices, industry 3545 shipped \$2,740 million of products primary to the industry, \$242 million of secondary products, and had \$182 million of miscellaneous receipts. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 92 percent (specialization ratio). In 1977, this specialization ratio was 89 percent.

Establishments in this industry also accounted for 89 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1977, the coverage ratio was 88 percent. The products primary to industry 3545, no matter in what industry they were produced, appear in table 6a and aggregate to \$3,069 million in current prices.

The total cost of materials and services used by establishments classified in the machine tool accessories industry amounted to \$980 million in current prices. Data on specific materials consumed appear in table 7.

The establishments in this industry with less than 10 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the

data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 13 percent of total value of shipments.

INDUSTRY 3546, POWER DRIVEN HAND TOOLS

This industry comprises establishments primarily engaged in the manufacture of power driven hand tools, such as drills and drilling tools, pneumatic and snagging grinders, and electric hammers. Establishments primarily engaged in the manufacture of automotive maintenance equipment are classified in industry 3549; those primarily manufacturing machine tools for metal cutting and metal forming (including home workshop tools) which are not supported in the hands of an operator are classified in industries 3541 and 3542; and those primarily manufacturing power driven heavy construction or mining hand tools in industry group 353.

In the 1982 Census of Manufactures, Industry 3546, Power Driven Hand Tools, recorded employment of 21.6 thousand. The total value of shipments for establishments classified in this industry was \$1,795 million.

The value of shipments figure shown above is in current (1982) prices. All dollar figures included in this report are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

The employment figure shown above was 22 percent below the 27.7 thousand reported in 1977. The leading States in employment in 1982 were North Carolina, South Carolina, Ohio, and Maryland, accounting for approximately 44 percent of the industry's 1982 employment. Data for South Carolina and Maryland have been withheld to avoid disclosing data for individual companies. This represents a shift from 1977 when South Carolina, Illinois, Maryland, and North Carolina accounted for approximately 40 percent of the industry's employment.

Compared with 1981, employment decreased 17 percent. The 1981 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. In current prices, industry 3546 shipped \$1,457 million of products primary to the industry, \$194 million of secondary products, and had \$144 million of miscellaneous receipts. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 88 percent (specialization ratio). In 1977, this specialization ratio was 91 percent.

Establishments in this industry also accounted for 91 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1977, the coverage ratio was 90 percent. The products primary to industry 3546, no matter in what industry they were produced, appear in table 6a and aggregate to \$1,595 million in current prices.

The total cost of materials and services used by establishments classified in the power driven hand tools industry amounted to \$792 million in current prices. Data on specific materials consumed appear in table 7.

The establishments in this industry with less than 10 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 3 percent of total value of shipments.

INDUSTRY 3547, ROLLING MILL MACHINERY

This industry comprises establishments primarily engaged in the manufacture of rolling mill machinery and processing equipment for metal production, such as cold forming mills, structural mills, and finishing equipment.

In the 1982 Census of Manufactures, Industry 3547, Rolling Mill Machinery, recorded employment of 5.1 thousand. The total value of shipments for establishments classified in this industry was \$503 million.

The value of shipments figure shown above is in current (1982) prices. All dollar figures included in this report are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

The employment figure shown above was 35 percent below the 7.9 thousand reported in 1977. The leading States in employment in 1982 were Pennsylvania, Ohio, Massachusetts, and California, accounting for approximately 84 percent of the industry's 1982 employment. Data for Massachusetts and California have been withheld to avoid disclosing data for individual companies. These same States were the leaders in 1977, when they accounted for approximately 85 percent of the industry's employment, although there has been some shift in the relative importance of individual States.

Compared with 1981, employment decreased 15 percent. The 1981 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. In current prices, industry 3547 shipped \$353 million of products primary to the industry, \$92 million of secondary products, and had \$59 million of miscellaneous receipts. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 79 percent (specialization ratio). In 1977, this specialization ratio was 78 percent.

Establishments in this industry also accounted for 79 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1977, the coverage ratio was 86 percent. The products primary to industry 3547, no matter in what industry they were produced, appear in table 6a and aggregate to \$445 million in current prices.

The total cost of materials and services used by establishments classified in the rolling mill machinery industry amounted to \$247 million in current prices. Data on specific materials consumed appear in table 7.

The establishments in this industry with less than 10 employees were excluded from the mail portion of the census.

The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 3 percent of total value of shipments.

INDUSTRY 3549, METALWORKING MACHINERY, N.E.C.

This industry comprises establishments primarily engaged in the manufacture of metalworking machinery, not elsewhere classified, such as gas cutting and welding equipment, wire fabricating machinery and equipment, except wire drawing dies, and automotive maintenance machinery and equipment. Establishments primarily engaged in the manufacture of metal cutting machine tools are classified in industry 3541, metal forming machine tools in industry 3542, power driven hand tools in industry 3546, and rolling mill machinery in industry 3547.

In the 1982 Census of Manufactures, Industry 3549, Metalworking Machinery, N.E.C., recorded employment of 20.7 thousand. The total value of shipments for establishments classified in this industry was \$1,472 million.

The value of shipments figure shown above is in current (1982) prices. All dollar figures included in this report are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

The employment figure shown above was 7 percent above the 19.4 thousand reported in 1977. The leading States in employment in 1982 were Illinois, New York, Michigan, and Ohio, accounting for approximately 39 percent of the industry's 1982 employment. This represents a shift from 1977 when Illinois, Ohio, New York, and New Jersey accounted for approximately 35 percent of the industry's employment.

Compared with 1981, employment decreased 17 percent. The 1981 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. In current prices, industry 3549 shipped \$1,176 million of products primary to the industry, \$187 million of secondary products, and had \$108 million of miscellaneous receipts. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 86 percent (specialization ratio). In 1977, this specialization ratio was 88 percent.

Establishments in this industry also accounted for 85 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1977, the coverage ratio was 82 percent. The products primary to industry 3549, no matter in what industry they were produced, appear in table 6a and aggregate to \$1,377 million in current prices.

The total cost of materials and services used by establishments classified in the metalworking machinery, n.e.c., industry amounted to \$600 million in current prices. Data on specific materials consumed appear in table 7.

The establishments in this industry with less than 10 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the

data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 9 percent of total value of shipments.

Table 1a. Historical Statistics for the Industry: 1982 and Earlier Years

[Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year¹	Com- panies² (no.)	All establishments³		All employees		Production workers			Value added by manufac- ture⁴ (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expend- itures (million dollars)	End-of- year inven- tories⁴ (million dollars)	Ratios	
		Total (no.)	With 20 employ- ees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						Spe- cial- ization (per- cent)	Cover- age (per- cent)
INDUSTRY 3541, MACHINE TOOLS, METAL CUTTING TYPES															
1982 Census	864	940	293	58.1	1 331.7	33.7	63.4	707.2	2 554.5	1 589.5	4 440.2	157.1	1 431.6	91	93
1981 ASM	(NA)	(NA)	(NA)	74.3	1 633.0	47.9	98.5	964.1	3 739.9	2 187.3	5 865.3	233.2	1 485.5	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	72.8	1 504.0	47.8	98.8	889.5	3 349.2	2 026.1	5 227.6	171.6	1 419.4	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	69.1	1 304.1	45.7	95.9	786.9	2 833.8	1 736.9	4 389.0	147.6	1 242.2	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	64.3	1 120.7	42.2	88.2	679.6	2 267.0	1 417.7	3 611.8	102.0	1 012.3	(NA)	(NA)
1977 Census	872	917	306	59.4	949.0	37.2	76.3	540.7	1 866.1	1 047.7	2 812.7	80.4	877.9	87	92
1976 ASM	(NA)	(NA)	(NA)	58.1	845.4	37.6	73.5	473.9	1 664.1	852.3	2 496.2	65.2	735.4	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	62.8	850.3	40.8	81.7	486.8	1 640.3	1 050.3	2 727.8	52.2	737.9	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	65.0	874.4	43.9	92.5	509.8	1 617.0	1 017.9	2 480.5	58.9	786.2	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	59.9	709.4	39.8	83.3	417.9	1 214.1	764.1	1 891.1	38.4	591.9	(NA)	(NA)
1972 Census	857	894	275	52.5	573.8	33.4	68.2	325.9	901.7	536.3	1 418.1	35.2	482.2	86	90
1971 ASM	(NA)	(NA)	(NA)	54.0	533.1	33.2	64.5	286.2	819.8	473.2	1 351.1	28.7	492.8	(NA)	(NA)
1970 ASM	(NA)	(NA)	(NA)	71.3	684.7	45.8	93.2	395.3	1 112.1	664.0	1 821.7	49.3	562.9	(NA)	(NA)
1969 ASM	(NA)	(NA)	(NA)	82.6	791.6	55.3	116.0	477.5	1 441.5	744.5	2 108.3	75.5	618.8	(NA)	(NA)
1968 ASM	(NA)	(NA)	(NA)	84.3	755.2	57.5	120.2	462.3	1 377.1	718.9	2 099.1	62.3	541.0	(NA)	(NA)
1967 Census	865	903	338	87.2	759.9	60.5	131.8	476.5	1 391.3	766.9	2 127.2	78.7	535.3	86	90
INDUSTRY 3542, MACHINE TOOLS, METAL FORMING TYPES															
1982 Census	434	452	162	19.5	438.1	12.1	23.2	245.3	777.8	574.6	1 428.7	43.4	511.5	89	87
1981 ASM	(NA)	(NA)	(NA)	24.0	496.8	16.0	30.8	294.9	976.5	662.7	1 615.7	63.0	479.7	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	26.9	514.1	18.2	35.2	313.2	1 042.1	718.5	1 753.1	69.4	455.2	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	27.0	485.6	18.7	37.5	305.1	1 004.0	687.0	1 663.5	58.1	447.0	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	25.2	415.6	17.0	35.1	253.2	841.3	576.4	1 366.0	40.4	421.7	(NA)	(NA)
1977 Census	411	426	163	23.7	360.7	16.1	32.8	219.4	721.9	444.0	1 130.6	24.7	359.6	90	87
1976 ASM	(NA)	(NA)	(NA)	22.9	336.8	15.9	32.0	214.2	621.1	433.9	1 070.7	28.3	312.9	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	26.0	343.1	17.7	35.8	208.2	618.3	483.2	1 106.6	23.9	362.5	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	29.0	370.8	20.3	43.3	238.2	633.7	505.4	1 099.3	34.4	363.8	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	27.0	323.6	18.9	41.8	205.1	546.5	370.8	886.2	27.5	293.8	(NA)	(NA)
1972 Census	375	383	162	24.1	265.4	16.6	34.7	163.8	417.7	285.3	696.3	17.5	242.7	89	87
1971 ASM	(NA)	(NA)	(NA)	24.4	241.5	16.0	32.9	142.5	363.9	278.0	667.7	10.4	233.2	(NA)	(NA)
1970 ASM	(NA)	(NA)	(NA)	28.9	280.6	20.1	43.4	177.3	469.6	328.6	776.1	23.4	257.6	(NA)	(NA)
1969 ASM	(NA)	(NA)	(NA)	28.0	270.6	19.4	42.4	172.0	453.1	290.2	726.5	29.5	234.8	(NA)	(NA)
1968 ASM	(NA)	(NA)	(NA)	27.9	245.8	19.4	42.9	157.4	453.3	270.0	718.2	28.6	214.4	(NA)	(NA)
1967 Census	344	350	168	29.2	249.6	20.9	46.2	165.0	437.2	295.4	714.0	26.2	207.8	85	84
INDUSTRY 3544, SPECIAL DIES, TOOLS, JIGS, AND FIXTURES															
1982 Census	7 131	7 255	1 322	102.9	2 293.3	81.7	164.9	1 684.9	3 780.5	1 535.4	5 374.9	232.9	621.8	94	79
1981 ASM	(NA)	(NA)	(NA)	124.2	2 632.4	99.6	209.3	1 905.7	4 423.7	1 884.8	6 264.3	275.9	693.1	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	126.3	2 471.0	101.6	214.3	1 798.7	4 121.0	1 734.3	5 823.9	283.5	646.3	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	122.1	2 231.2	98.9	214.5	1 641.7	3 810.6	1 607.5	5 336.2	294.4	574.7	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	112.5	1 946.6	92.7	195.2	1 419.9	3 183.2	1 424.2	4 585.1	228.9	510.2	(NA)	(NA)
1977 Census	7 034	7 153	1 427	105.7	1 708.2	86.4	184.0	1 261.7	2 790.1	1 171.8	3 905.3	177.5	450.3	94	79
1976 ASM	(NA)	(NA)	(NA)	109.9	1 537.0	88.7	179.4	1 163.2	2 502.1	951.0	3 411.6	168.9	370.3	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	102.9	1 336.6	83.8	168.7	1 005.8	2 141.8	824.7	2 985.6	114.4	315.8	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	117.4	1 486.6	97.2	205.7	1 134.4	2 459.5	928.8	3 367.5	193.1	328.3	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	105.7	1 314.8	87.4	193.6	999.9	2 256.2	782.8	2 930.7	101.7	300.4	(NA)	(NA)
1972 Census	6 513	6 616	1 266	97.8	1 113.8	80.5	173.3	843.6	1 797.4	648.0	2 423.7	97.0	244.1	94	78
1971 ASM	(NA)	(NA)	(NA)	98.8	1 036.9	80.5	165.9	772.1	1 556.7	591.6	2 160.3	81.9	231.3	(NA)	(NA)
1970 ASM	(NA)	(NA)	(NA)	111.8	1 151.8	92.0	196.3	874.3	1 800.7	657.5	2 470.8	82.9	241.2	(NA)	(NA)
1969 ASM	(NA)	(NA)	(NA)	114.5	1 152.0	94.6	212.9	883.3	1 775.9	629.4	2 387.7	102.1	243.8	(NA)	(NA)
1968 ASM	(NA)	(NA)	(NA)	106.7	1 032.7	88.6	199.8	798.7	1 631.4	562.8	2 193.8	118.4	204.8	(NA)	(NA)
1967 Census	6 532	6 615	1 531	113.6	1 032.8	95.5	214.2	800.0	1 646.7	577.6	2 202.3	114.7	214.2	94	74
INDUSTRY 3545, MACHINE TOOL ACCESSORIES															
1982 Census	1 444	1 620	562	55.1	1 069.4	38.8	73.5	690.1	2 162.9	979.9	3 163.9	144.0	905.5	92	89
1981 ASM	(NA)	(NA)	(NA)	62.2	1 198.5	45.8	91.1	782.0	2 701.5	1 407.9	4 062.4	194.7	849.8	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	61.5	1 090.9	45.5	90.7	717.3	2 529.1	1 306.5	3 728.3	140.3	782.5	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	60.7	991.1	45.9	93.8	664.6	2 278.9	1 193.1	3 376.1	121.4	672.1	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	58.2	892.3	43.7	88.5	603.1	1 969.8	979.1	2 876.1	97.3	564.5	(NA)	(NA)
1977 Census	1 270	1 411	491	54.0	762.0	39.9	80.1	498.0	1 584.8	832.5	2 383.0	77.2	468.3	89	88
1976 ASM	(NA)	(NA)	(NA)	51.0	634.4	37.6	73.5	414.4	1 293.4	653.6	1 942.3	51.5	406.0	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	52.4	616.4	38.2	77.1	405.3	1 236.2	599.1	1 847.8	50.3	411.4	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	56.1	625.6	41.7	86.9	422.7	1 322.0	609.8	1 884.1	59.5	425.2	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	52.8	569.3	39.2	81.4	380.6	1 142.6	496.4	1 602.4	36.6	344.4	(NA)	(NA)
1972 Census	1 113	1 231	413	46.7	456.6	33.6	67.0	294.5	876.1	378.5	1 243.4	30.2	289.0	86	87
1971 ASM	(NA)	(NA)	(NA)	45.9	410.4	31.9	60.8	253.2	716.4	340.2	1 081.2	20.7	293.5	(NA)	(NA)
1970 ASM	(NA)	(NA)	(NA)	52.5	461.5	37.4	72.9	293.6	836.8	378.9	1 206.7	35.4	300.8	(NA)	(NA)
1969 ASM	(NA)	(NA)	(NA)	59.8	502.										

Table 1a. Historical Statistics for the Industry: 1982 and Earlier Years—Con.

[Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year ¹	Com- panies ² (no.)	All establishments ³		All employees		Production workers			Value added by manufac- ture ⁴ (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expend- itures (million dollars)	End-of- year invento- ries ⁴ (million dollars)	Ratios	
		Total (no.)	With 20 employ- ees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						Spe- cial- ization (per- cent)	Cover- age (per- cent)
	INDUSTRY 3547, ROLLING MILL MACHINERY														
1982 Census-----	58	63	32	5.1	125.1	3.3	6.1	70.8	276.4	246.8	502.9	14.8	168.1	79	79
1981 ASM-----	(NA)	(NA)	(NA)	6.0	135.1	3.9	7.6	81.9	410.4	341.4	736.3	8.3	161.5	(NA)	(NA)
1980 ASM-----	(NA)	(NA)	(NA)	6.4	139.4	4.5	8.6	87.3	358.1	314.3	687.1	12.8	132.0	(NA)	(NA)
1979 ASM-----	(NA)	(NA)	(NA)	6.1	119.3	4.2	8.7	76.9	296.1	232.3	481.9	⁵ 30.9	154.0	(NA)	(NA)
1978 ASM-----	(NA)	(NA)	(NA)	7.6	137.6	5.3	9.3	83.6	289.7	189.3	495.2	7.6	118.8	(NA)	(NA)
1977 Census-----	58	63	38	7.9	128.2	5.4	10.4	78.4	286.9	198.3	507.4	9.1	131.8	78	86
1976 ASM-----	(NA)	(NA)	(NA)	10.9	156.2	7.8	14.8	99.3	350.9	247.4	620.8	14.5	168.4	(NA)	(NA)
1975 ASM-----	(NA)	(NA)	(NA)	10.6	141.1	8.0	15.2	95.3	331.0	259.7	540.5	12.1	181.1	(NA)	(NA)
1974 ASM-----	(NA)	(NA)	(NA)	10.3	132.9	8.1	16.1	92.6	297.1	202.0	472.2	11.1	136.0	(NA)	(NA)
1973 ASM-----	(NA)	(NA)	(NA)	9.2	108.1	7.1	14.3	73.1	244.6	152.6	377.2	7.7	106.6	(NA)	(NA)
1972 Census ⁶ -----	40	47	38	10.4	115.2	7.2	14.2	68.7	206.4	129.0	327.8	6.3	81.0	74	86
	INDUSTRY 3549, METALWORKING MACHINERY, N.E.C.														
1982 Census-----	421	446	197	20.7	431.5	13.0	25.4	233.3	830.3	600.0	1 471.5	52.4	337.6	86	85
1981 ASM-----	(NA)	(NA)	(NA)	25.0	476.4	16.1	33.6	261.0	950.3	724.4	1 655.7	⁶ 64.8	412.5	(NA)	(NA)
1980 ASM-----	(NA)	(NA)	(NA)	24.8	448.5	16.2	33.1	244.5	939.3	665.9	1 550.5	⁸ 82.5	386.5	(NA)	(NA)
1979 ASM-----	(NA)	(NA)	(NA)	24.0	395.0	16.3	32.9	220.5	815.7	572.9	1 340.9	⁶ 61.9	331.4	(NA)	(NA)
1978 ASM-----	(NA)	(NA)	(NA)	20.6	316.2	13.6	26.8	175.5	637.9	471.3	1 106.1	⁸ 28.0	247.7	(NA)	(NA)
1977 Census-----	521	534	183	19.4	279.5	12.8	25.2	154.1	562.2	389.1	916.8	30.7	233.8	88	82
1976 ASM-----	(NA)	(NA)	(NA)	14.7	182.1	9.9	19.5	101.4	324.5	275.7	595.9	13.5	151.8	(NA)	(NA)
1975 ASM-----	(NA)	(NA)	(NA)	14.5	163.8	9.4	18.2	88.5	290.3	261.5	571.5	19.4	149.7	(NA)	(NA)
1974 ASM-----	(NA)	(NA)	(NA)	15.6	167.2	11.0	21.3	95.9	345.0	264.9	587.0	17.9	178.8	(NA)	(NA)
1973 ASM-----	(NA)	(NA)	(NA)	15.1	153.3	10.1	20.7	91.9	314.5	203.0	490.2	18.9	133.8	(NA)	(NA)
1972 Census ⁶ -----	384	393	134	13.6	131.5	9.2	18.3	77.6	267.9	165.4	427.3	12.3	107.6	88	83

¹In annual survey of manufactures (ASM) years, data are estimates based on a representative sample of establishments canvassed annually and may differ from results of a complete canvass of all establishments. ASM publication shows percentage standard errors. Unless otherwise noted, for data prior to 1967, see 1967 Census of Manufactures, vol. II, table 1 of the Industry chapter.

²For the census, a company is defined as a business organization consisting of one establishment or more under common ownership or control.

³Includes establishments with payroll at any time during year.

⁴Effective with the 1982 Economic Censuses, uniform instructions for reporting inventories were introduced for all sector reports. Up to 1982, respondents were permitted to value inventories using any generally accepted accounting method (FIFO, LIFO, market, to name a few). In 1982, LIFO users were asked to first report inventory values prior to the LIFO adjustment and then to report the LIFO reserve and the LIFO value after adjustment for the reserve.

Because of this change in reporting instructions, the 1982 data for inventories and value added by manufacture included in the tables of this report are not comparable to the prior-year data shown above and in historical census of manufactures and annual survey of manufactures publications. Inventories and value added data estimated on a basis comparable to the historical data, using the reported information for 1982, are shown below:

Industries	End-of-1981 inventories (million dollars)	End-of-1982 inventories (million dollars)	1982 value added by manufacture (million dollars)
Industry 3541, Machine tools, metal cutting types ----	1 451.0	1 149.4	2 580.2
Industry 3542, Machine tools, metal forming types ---	515.1	423.6	774.7
Industry 3544, Special dies, tools, jigs, and fixtures----	642.9	599.8	3 793.2
Industry 3545, Machine tool accessories -----	807.8	769.2	2 169.6
Industry 3546, Power driven hand tools -----	413.1	350.8	949.1
Industry 3547, Rolling mill machinery -----	145.0	165.5	275.9
Industry 3549, Metalworking machinery, n.e.c. -----	356.0	304.9	835.1

See Inventories in appendixes for explanation of the difference between end-of-1981 inventory figure shown in table and corresponding figure shown in footnote.

⁵Industry was defined or redefined for 1972 Census of Manufactures, so data are available only for years shown.

⁶Estimate for new capital expenditures has associated standard error of 15 percent or more and may be of limited reliability. Estimates for other data items are of acceptable reliability.

Table 1b. Selected Operating Ratios for the Industry: 1982 and Earlier Years

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
INDUSTRY 3541, MACHINE TOOLS, METAL CUTTING TYPES									
1982 Census.....	22 921	58	1 881	11.15	36	66	43 967	52	40.29
1981 ASM.....	21 978	64	2 056	9.79	37	65	50 335	44	37.97
1980 ASM.....	20 659	66	2 067	9.00	39	68	46 005	45	33.90
1979 ASM.....	18 873	66	2 098	8.21	40	69	41 010	46	29.55
1978 ASM.....	17 429	66	2 090	7.71	39	70	35 257	49	25.70
1977 Census.....	15 976	63	2 051	7.09	37	71	31 416	51	24.46
1976 ASM.....	14 551	65	1 955	6.45	34	68	28 642	51	22.64
1975 ASM.....	13 540	65	2 002	5.96	39	70	26 119	52	20.08
1974 ASM.....	13 452	68	2 107	5.51	41	76	24 877	54	17.48
1973 ASM.....	11 843	66	2 093	5.02	40	78	20 269	58	14.58
1972 Census.....	10 930	64	2 042	4.78	38	78	17 175	64	13.22
1971 ASM.....	9 872	61	1 943	4.44	35	74	15 181	65	12.71
1970 ASM.....	9 603	64	2 035	4.24	36	74	15 597	62	11.93
1969 ASM.....	9 584	67	2 098	4.12	35	73	17 452	55	12.43
1968 ASM.....	8 958	68	2 090	3.85	34	70	16 336	55	11.46
1967 Census.....	8 714	69	2 179	3.62	36	72	15 955	55	10.56

See footnotes at end of table.

Table 1b. Selected Operating Ratios for the Industry: 1982 and Earlier Years—Con.

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
INDUSTRY 3542, MACHINE TOOLS, METAL FORMING TYPES									
1982 Census	22 467	62	1 917	10.57	40	71	39 887	56	33.53
1981 ASM	20 700	67	1 925	9.57	41	72	40 688	51	31.70
1980 ASM	19 112	68	1 934	8.90	41	70	38 740	49	29.61
1979 ASM	17 985	69	2 005	8.14	41	70	37 185	48	26.77
1978 ASM	16 492	67	2 065	7.21	42	73	33 385	49	23.97
1977 Census	15 219	68	2 037	6.69	39	71	30 460	50	22.01
1976 ASM	14 707	69	2 013	6.69	41	72	27 122	54	19.41
1975 ASM	13 196	68	2 023	5.82	44	75	23 781	55	17.27
1974 ASM	12 786	70	2 133	5.50	46	80	21 852	59	14.64
1973 ASM	11 985	70	2 212	4.91	42	78	20 241	59	13.07
1972 Census	11 012	69	2 090	4.72	41	79	17 332	64	12.04
1971 ASM	9 898	66	2 056	4.33	42	78	14 914	66	11.06
1970 ASM	9 709	70	2 159	4.09	42	78	16 249	60	10.82
1969 ASM	9 664	69	2 186	4.06	40	77	16 182	60	10.69
1968 ASM	8 810	70	2 211	3.67	38	72	16 247	54	10.57
1967 Census	8 548	72	2 211	3.57	41	76	14 973	57	9.46
INDUSTRY 3544, SPECIAL DIES, TOOLS, JIGS, AND FIXTURES									
1982 Census	22 287	79	2 018	10.22	29	71	36 740	61	22.93
1981 ASM	21 195	80	2 101	9.11	30	72	35 618	60	21.14
1980 ASM	19 565	80	2 109	8.39	30	72	32 629	60	19.23
1979 ASM	18 274	81	2 169	7.65	30	72	31 209	59	17.77
1978 ASM	17 303	82	2 106	7.27	31	74	28 295	61	16.31
1977 Census	16 161	82	2 130	6.86	30	74	26 396	61	15.16
1976 ASM	13 985	81	2 023	6.48	28	73	22 767	61	13.95
1975 ASM	12 989	81	2 013	5.96	28	72	20 814	62	12.70
1974 ASM	12 663	83	2 116	5.51	28	72	20 950	60	11.96
1973 ASM	12 439	83	2 215	5.16	27	72	21 345	58	11.65
1972 Census	11 389	82	2 153	4.87	27	73	18 378	62	10.37
1971 ASM	10 495	81	2 061	4.65	27	75	15 756	67	9.38
1970 ASM	10 302	82	2 134	4.45	27	73	16 106	64	9.17
1969 ASM	10 061	83	2 251	4.15	26	75	15 510	65	8.34
1968 ASM	9 679	83	2 255	4.00	26	73	15 290	63	8.17
1967 Census	9 092	84	2 243	3.73	26	73	14 496	63	7.69
INDUSTRY 3545, MACHINE TOOL ACCESSORIES									
1982 Census	19 408	70	1 894	9.39	31	65	39 254	49	29.43
1981 ASM	19 268	74	1 989	8.58	35	64	43 434	44	29.66
1980 ASM	17 738	74	1 993	7.91	35	64	41 124	43	27.88
1979 ASM	16 328	76	2 044	7.09	35	65	37 544	43	24.30
1978 ASM	15 332	75	2 025	6.81	34	65	33 845	45	22.26
1977 Census	14 111	74	2 008	6.22	35	67	29 348	48	19.79
1976 ASM	12 439	74	1 955	5.64	34	66	25 361	49	17.60
1975 ASM	11 763	73	2 018	5.26	32	66	23 592	50	16.03
1974 ASM	11 152	74	2 084	4.86	32	66	23 565	47	15.21
1973 ASM	10 782	74	2 077	4.68	31	67	21 640	50	14.04
1972 Census	9 777	72	1 994	4.40	30	67	18 760	52	13.08
1971 ASM	8 941	69	1 906	4.16	31	69	15 608	57	11.78
1970 ASM	8 790	71	1 949	4.03	31	70	15 939	55	11.48
1969 ASM	8 396	74	2 088	3.56	30	66	16 662	50	10.77
1968 ASM	8 143	74	2 105	3.51	31	67	15 720	52	10.12
1967 Census	7 949	75	2 133	3.36	32	68	15 303	52	9.57
INDUSTRY 3546, POWER DRIVEN HAND TOOLS									
1982 Census	18 222	67	1 786	8.83	44	66	43 532	42	36.31
1981 ASM	16 700	71	1 930	7.83	43	64	48 619	34	35.41
1980 ASM	14 426	74	1 844	6.99	44	63	42 446	34	31.20
1979 ASM	13 833	74	1 912	6.56	46	67	37 313	37	26.26
1978 ASM	12 668	73	1 909	5.84	45	65	35 879	35	25.58
1977 Census	11 758	72	1 925	5.46	43	63	33 643	35	24.21
1976 ASM	11 900	72	1 912	5.45	40	63	31 932	37	23.11
1975 ASM	10 373	69	1 864	4.99	39	60	28 481	36	22.04
1974 ASM	9 682	74	1 938	4.47	39	62	27 648	35	19.29
1973 ASM	9 396	71	1 984	4.28	43	70	21 208	44	15.07
1972 Census	8 758	73	1 947	3.78	41	69	18 810	47	13.21
INDUSTRY 3547, ROLLING MILL MACHINERY									
1982 Census	24 529	65	1 848	11.61	49	74	54 196	45	45.31
1981 ASM	22 517	65	1 949	10.78	46	65	68 400	33	54.00
1980 ASM	21 781	70	1 911	10.15	46	66	55 953	39	41.64
1979 ASM	19 557	69	2 071	8.84	48	73	48 541	40	34.03
1978 ASM	18 105	70	1 755	8.99	38	66	38 118	47	31.15
1977 Census	16 228	68	1 926	7.54	39	64	36 316	45	27.59
1976 ASM	14 330	72	1 897	6.71	40	65	32 193	45	23.71
1975 ASM	13 311	75	1 900	6.27	48	74	31 226	43	21.78
1974 ASM	12 903	79	1 988	5.75	43	71	28 845	45	18.45
1973 ASM	11 750	77	2 014	5.11	40	69	26 587	44	17.10
1972 Census	11 077	69	1 972	4.84	39	74	19 846	56	14.54

See footnotes at end of table.

Table 1b. Selected Operating Ratios for the Industry: 1982 and Earlier Years—Con.

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
INDUSTRY 3549, METALWORKING MACHINERY, N.E.C.									
1982 Census	20 845	63	1 954	9.19	41	70	40 111	52	32.69
1981 ASM	19 056	64	2 087	7.77	44	73	38 012	50	28.28
1980 ASM	18 085	65	2 043	7.39	43	72	37 875	48	28.38
1979 ASM	16 458	68	2 018	6.70	43	72	33 987	48	24.79
1978 ASM	15 350	66	1 971	6.55	43	71	30 966	50	23.80
1977 Census	14 407	66	1 969	6.12	42	73	28 979	50	22.31
1976 ASM	12 388	67	1 970	5.20	46	77	22 075	56	16.64
1975 ASM	11 297	65	1 936	4.86	46	74	20 021	56	15.95
1974 ASM	10 718	71	1 936	4.50	45	74	22 115	48	16.20
1973 ASM	10 152	67	2 050	4.44	41	73	20 828	49	15.19
1972 Census	9 669	68	1 989	4.24	39	69	19 699	49	14.64

Note: For qualifications of data, see footnotes on table 1a.

Table 2. Industry Statistics for Selected States: 1982 and 1977

[Excludes data for auxiliaries. Includes data for States with 150 employees or more. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area		1982											1977		
		All establishments ²		All employees		Production workers			Value added by manufacture ⁴ (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees ³ (1,000)	Value added by manufacture (million dollars)	
		Total (no.)	With 20 employees or more (no.)	Number ³ (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)							
E ¹															
INDUSTRY 3541, MACHINE TOOLS, METAL CUTTING TYPES															
United States		-	940	293	58.1	1 331.7	33.7	63.4	707.2	2 554.5	1 589.5	4 440.2	157.1	59.4	1 866.1
California		E1	93	12	1.4	26.9	.9	1.7	15.3	50.4	34.7	88.1	2.6	1.5	59.9
Connecticut		-	61	17	5.1	117.3	3.1	5.6	59.5	180.4	121.1	326.0	9.0	4.6	148.0
Florida		E2	20	2	.2	2.5	.1	.2	1.5	5.3	3.6	9.3	.6	(NA)	(NA)
Illinois		E1	90	30	5.4	122.7	3.0	5.5	64.1	207.9	135.9	357.8	13.5	6.5	195.6
Indiana		-	22	4	1.3	26.4	.8	1.5	14.3	35.7	44.4	82.6	(D)	1.4	39.3
Iowa		-	4	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.5	11.5
Kansas		-	7	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Kentucky		-	7	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Maine		-	6	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Massachusetts		-	35	11	2.6	55.6	1.6	3.0	27.0	114.4	55.0	175.7	6.7	2.2	65.6
Michigan		-	203	83	8.9	259.4	5.2	10.7	139.8	491.1	421.1	1 055.9	23.0	9.2	357.6
Minnesota		-	24	6	1.2	25.0	.7	1.4	14.2	49.0	24.6	72.6	1.2	1.3	40.1
Missouri		E1	7	1	.2	2.7	.1	.2	1.3	3.1	4.5	8.3	.2	(NA)	(NA)
New Hampshire		-	5	3	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
New Jersey		E1	27	4	.4	7.9	.2	.4	3.8	17.1	11.1	28.0	(D)	.4	10.0
New York		-	42	14	4.9	107.6	3.1	5.1	64.0	176.2	94.3	275.2	13.4	4.7	147.6
North Carolina		-	8	4	.2	4.7	.1	.2	1.9	8.2	11.6	22.2	.2	(NA)	(NA)
Ohio		-	75	35	12.3	282.8	6.5	11.6	138.5	546.8	314.3	934.3	39.7	13.9	388.9
Pennsylvania		-	34	12	2.1	40.3	1.3	2.7	23.5	86.2	31.5	121.2	3.7	1.9	47.6
Rhode Island		-	16	5	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	2.4	61.9
South Carolina		E5	5	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
South Dakota		-	3	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
Tennessee		-	3	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Texas		E5	22	6	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.2	4.8
Vermont		-	6	4	2.6	50.6	1.6	2.9	30.4	90.7	49.0	152.7	(D)	2.8	86.8
Virginia		-	5	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Washington		E5	18	2	.2	3.6	.1	.2	2.5	6.9	4.3	11.5	.3	.2	4.7
Wisconsin		-	38	15	3.4	81.2	1.9	3.7	41.1	254.6	112.1	375.2	10.9	3.7	128.3
INDUSTRY 3542, MACHINE TOOLS, METAL FORMING TYPES															
United States		E1	452	162	19.5	438.1	12.1	23.2	245.3	777.8	574.6	1 428.7	43.4	23.7	721.9
California		E2	42	13	1.0	22.8	.6	1.2	11.9	38.0	33.4	79.0	1.4	1.1	36.7
Colorado		-	6	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.4	9.8
Connecticut		E2	24	9	.8	17.4	.6	1.0	10.9	27.7	18.7	48.4	1.8	1.8	49.7
Illinois		-	56	25	4.4	106.3	2.7	5.2	61.2	231.6	139.5	396.5	7.7	6.4	177.2
Indiana		-	10	7	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.6	18.1
Kansas		-	5	3	.3	5.5	.2	.4	4.6	10.2	8.8	19.3	(D)	.3	6.6
Massachusetts		E1	13	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.2	6.0
Michigan		-	55	22	1.6	34.0	1.1	2.2	20.2	67.4	45.3	116.7	3.7	2.0	67.7
Minnesota		-	5	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Missouri		E2	11	4	.3	4.9	.2	.4	3.0	9.4	5.5	15.1	1.0	.3	5.3
New Jersey		E2	20	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
New York		-	31	9	1.7	39.9	1.0	1.9	21.9	49.3	31.5	90.8	3.0	2.2	64.5
North Carolina		E3	4	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
Ohio		-	47	18	4.4	101.4	2.5	4.7	49.9	173.0	154.0	329.2	10.5	4.6	167.3
Pennsylvania		-	24	10	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.9	36.5
Virginia		-	4	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Washington		-	6	2	.2	6.2	.2	.3	4.8	8.4	3.7	12.3	(D)	BB	(D)

See footnotes at end of table.

Table 2. Industry Statistics for Selected States: 1982 and 1977—Con.

[Excludes data for auxiliaries. Includes data for States with 150 employees or more. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area	1982												1977	
	E ¹	All establishments ²		All employees		Production workers			Value added by manufacture ⁴ (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees ³ (1,000)	Value added by manufacture (million dollars)
		Total (no.)	With 20 employees or more (no.)	Number ³ (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						
INDUSTRY 3544, SPECIAL DIES, TOOLS, JIGS, AND FIXTURES														
United States	E1	7 255	1 322	102.9	2 293.3	81.7	164.9	1 684.9	3 780.5	1 535.4	5 374.9	232.9	105.7	2 790.1
Alabama	E1	40	11	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.5	10.4
Arizona	E1	49	9	.5	10.2	.4	.8	7.7	16.5	5.9	22.4	(D)	AA	(D)
Arkansas	E1	46	3	.3	5.2	.3	.5	4.0	8.0	3.6	11.9	.9	(NA)	(NA)
California	-	649	85	6.8	150.1	5.4	10.6	109.3	266.0	105.9	374.9	17.4	6.4	161.2
Colorado	-	36	5	.3	7.1	.2	.5	5.1	14.1	3.9	18.3	.7	.4	7.8
Connecticut	E1	272	34	2.9	62.5	2.2	4.5	42.1	97.7	33.8	131.4	6.5	3.1	68.1
Florida	E1	155	18	1.5	26.7	1.2	2.4	19.3	44.1	17.9	62.9	2.9	1.1	28.6
Georgia	E1	55	8	.6	10.9	.5	1.0	8.4	17.6	7.6	25.3	1.6	.4	10.1
Illinois	-	733	128	9.1	215.8	7.3	15.0	158.8	354.8	141.5	499.3	22.4	9.4	258.0
Indiana	-	361	86	5.8	122.0	4.6	9.3	90.0	186.2	72.8	261.3	11.0	6.5	165.0
Iowa	-	50	11	.6	13.1	.5	.9	10.6	16.8	9.2	26.9	1.1	.6	15.6
Kansas	-	34	4	.3	6.5	.3	.5	4.8	10.2	2.5	13.2	(D)	.2	4.4
Kentucky	E2	73	9	.8	12.6	.6	1.2	9.9	20.3	8.6	28.8	(D)	CC	(D)
Maine	E1	15	4	.3	5.6	.2	.5	4.2	10.9	4.2	13.9	.6	AA	(D)
Maryland	E1	22	4	.3	6.5	.2	.5	4.1	7.1	7.3	14.7	.6	.2	4.9
Massachusetts	-	259	57	3.6	71.7	3.0	6.1	53.9	111.7	46.7	159.1	9.8	3.7	84.6
Michigan	-	1 208	287	23.8	627.2	19.0	39.5	465.3	1 059.5	448.1	1 526.2	46.9	27.4	855.0
Minnesota	-	152	21	1.8	37.3	1.4	2.9	27.6	62.4	27.7	92.6	5.2	1.2	29.4
Mississippi	-	24	5	.3	4.6	.2	.4	3.3	8.8	3.0	11.8	.4	.2	3.6
Missouri	E1	157	20	1.8	39.8	1.5	3.1	29.5	63.8	35.0	99.2	4.8	1.9	49.2
Nebraska	E1	16	3	.2	2.7	.1	.3	1.8	4.7	1.3	6.1	(D)	(NA)	(NA)
New Hampshire	E1	33	3	.3	5.2	.2	.4	3.7	8.7	3.6	12.3	(D)	.2	4.2
New Jersey	-	336	48	3.9	82.4	3.2	6.4	61.7	135.8	55.1	194.3	10.7	4.4	109.0
New York	E1	423	65	5.0	91.4	4.0	7.8	66.6	148.6	55.7	206.5	9.8	5.7	128.0
North Carolina	E1	62	9	.7	12.5	.5	1.0	9.4	20.1	6.7	27.1	(D)	.6	13.2
Ohio	-	801	179	13.7	298.5	11.1	22.0	223.0	488.2	191.3	689.7	28.9	14.4	367.8
Oklahoma	E3	27	2	.2	3.9	.2	.4	3.0	6.9	3.1	10.0	.6	.2	2.3
Oregon	E4	42	3	.3	5.6	.2	.4	4.2	10.5	3.4	13.9	.8	(NA)	(NA)
Pennsylvania	-	412	100	8.2	180.9	6.4	12.6	128.1	300.5	122.1	431.6	21.8	7.7	201.3
Rhode Island	E1	55	3	.4	8.1	.3	.6	5.5	12.6	4.1	16.8	.7	.6	12.2
South Carolina	-	40	5	.4	6.3	.3	.6	4.4	12.7	6.0	18.6	(D)	BB	(D)
Tennessee	-	119	17	1.2	21.8	.9	1.9	16.0	36.4	14.4	50.6	3.0	1.1	22.4
Texas	E3	132	21	1.4	27.4	1.1	2.3	20.3	49.6	22.8	72.6	3.3	1.1	20.9
Virginia	E1	20	1	.2	3.5	.1	.3	2.3	5.4	2.6	8.1	.4	.3	6.4
Washington	E2	31	1	.2	3.2	.1	.2	2.6	5.1	2.3	7.4	.5	(NA)	(NA)
Wisconsin	-	266	47	3.9	86.9	3.0	6.0	62.0	127.2	45.1	173.5	11.5	3.6	93.1
INDUSTRY 3545, MACHINE TOOL ACCESSORIES														
United States	E1	1 620	562	55.1	1 069.4	38.8	73.5	690.1	2 162.9	979.9	3 163.9	144.0	54.0	1 584.8
Alabama	-	11	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Arkansas	-	14	5	.9	14.5	.6	1.1	8.6	29.1	16.4	49.5	3.1	1.0	25.4
California	-	178	40	2.4	44.6	1.8	3.4	29.2	86.7	40.5	129.9	4.0	2.5	60.3
Connecticut	-	91	29	2.5	47.1	1.7	3.3	28.3	83.7	38.6	120.8	3.9	2.6	68.1
Florida	-	34	9	.8	13.8	.5	.9	7.4	24.0	13.2	38.2	(D)	.2	7.6
Georgia	-	12	4	.8	11.7	.7	1.0	7.4	25.9	10.0	37.2	1.8	CC	(D)
Illinois	E1	119	42	4.9	95.4	3.3	6.3	59.2	173.7	95.0	276.0	10.1	5.5	155.0
Indiana	-	44	16	1.0	19.3	.8	1.5	12.6	36.1	15.1	52.0	2.9	.9	22.4
Iowa	-	10	4	.2	5.1	.2	.4	3.2	9.3	4.9	14.1	.5	AA	(D)
Massachusetts	-	66	27	5.4	101.6	3.7	7.3	68.9	186.2	84.9	267.0	8.7	5.8	157.4
Michigan	-	406	163	11.6	261.3	8.3	15.5	170.0	502.0	226.8	735.2	35.0	12.9	428.5
Minnesota	-	23	6	.5	9.0	.3	.6	5.7	19.1	11.2	29.3	(D)	.5	9.7
Mississippi	E1	5	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Missouri	-	11	5	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.1	41.1
New Hampshire	E6	14	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.3	7.8
New Jersey	E1	55	17	1.2	22.9	.9	1.8	15.3	55.4	32.7	89.5	3.6	1.4	37.1
New York	E1	99	26	2.4	44.1	1.6	3.3	27.2	85.4	46.3	131.4	6.3	1.6	51.6
North Carolina	-	17	8	.8	13.7	.6	1.2	9.5	34.1	15.2	48.3	5.1	.3	3.8
Ohio	-	141	57	7.7	151.5	5.3	9.9	98.2	352.0	132.5	484.7	18.4	7.8	231.1
Pennsylvania	-	53	20	2.1	41.3	1.5	2.9	27.6	77.0	38.2	115.5	5.8	3.2	122.7
Rhode Island	-	15	7	1.3	24.6	.9	1.7	15.6	43.9	14.4	56.7	(D)	1.3	32.9
South Carolina	-	20	15	1.4	20.4	.9	1.7	12.6	57.3	25.1	82.5	(D)	.6	13.0
Tennessee	-	14	6	.8	13.1	.7	1.3	10.6	46.6	12.2	59.7	4.4	.5	10.5
Texas	E2	50	14	.9	15.8	.6	1.3	11.3	37.4	20.0	57.8	3.1	.4	16.8
Vermont	-	6	5	.8	13.4	.6	1.3	10.0	25.9	8.9	35.5	(D)	.7	18.5
Virginia	E1	9	4	.4	5.4	.3	.6	4.3	20.3	3.9	23.0	(D)	(NA)	(NA)
Wisconsin	-	33	11	1.4	25.0	1.0	1.8	16.3	51.0	28.3	78.5	(D)	.9	25.9

See footnotes at end of table.

Table 2. Industry Statistics for Selected States: 1982 and 1977—Con.

[Excludes data for auxiliaries. Includes data for States with 150 employees or more. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area	1982												1977	
	E¹	All establishments²		All employees		Production workers			Value added by manufacture⁴ (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employ-ees³ (1,000)	Value added by manufac-ture (million dollars)
		Total (no.)	With 20 employ-ees or more (no.)	Number³ (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						
INDUSTRY 3546, POWER DRIVEN HAND TOOLS														
United States -----	-	203	74	21.6	393.6	14.5	25.9	228.6	940.3	791.5	1 795.3	68.1	27.7	931.9
Arizona -----	-	4	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Arkansas -----	-	3	3	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
California -----	E1	31	6	.6	9.9	.5	.9	6.3	14.2	17.7	35.0	(D)	CC	(D)
Florida -----	E2	9	4	.2	2.4	.1	.3	1.4	6.3	5.9	12.4	(D)	(NA)	(NA)
Illinois -----	-	24	8	1.1	25.0	.8	1.6	14.3	41.3	55.8	97.8	(D)	3.1	82.7
Iowa -----	-	3	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Louisiana -----	-	3	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Maryland -----	-	1	1	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
Massachusetts -----	-	8	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Michigan -----	-	8	3	.4	9.6	.3	.5	6.6	.1	6.1	15.8	(D)	1.2	35.2
Mississippi -----	-	1	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New York -----	-	10	4	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
North Carolina -----	-	7	5	3.4	49.9	2.4	3.5	29.2	155.3	170.6	346.0	14.4	EE	(D)
Ohio -----	-	21	9	2.0	45.9	1.0	2.0	20.7	64.3	26.8	96.1	4.4	2.7	90.9
Pennsylvania -----	-	8	3	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
South Carolina -----	-	5	4	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
Tennessee -----	-	3	2	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Texas -----	-	7	4	.7	15.9	.4	.7	7.2	28.1	13.9	41.2	.9	CC	(D)
Virginia -----	-	1	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Wisconsin -----	-	7	2	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
INDUSTRY 3547, ROLLING MILL MACHINERY														
United States -----	-	63	32	5.1	125.1	3.3	6.1	70.8	276.4	246.8	502.9	14.8	7.9	286.9
California -----	-	3	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Massachusetts -----	-	1	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
New Jersey -----	-	4	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Ohio -----	-	13	11	1.4	34.1	1.1	1.9	25.5	76.5	82.9	154.4	2.7	2.7	118.3
Pennsylvania -----	-	8	7	1.9	45.6	1.2	2.3	24.5	118.8	95.1	201.3	6.3	2.9	96.6
INDUSTRY 3549, METALWORKING MACHINERY, N.E.C.														
United States -----	-	446	197	20.7	431.5	13.0	25.4	233.3	830.3	600.0	1 471.5	52.4	19.4	562.2
Arkansas -----	-	5	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
California -----	-	44	11	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.9	19.1
Colorado -----	-	7	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.2	5.3
Connecticut -----	-	25	10	.8	16.1	.5	1.0	8.3	26.6	20.6	48.1	1.6	.7	17.6
Florida -----	-	6	2	.5	4.8	.4	.8	3.7	7.9	4.3	12.3	(D)	.4	7.6
Georgia -----	-	8	3	.4	6.3	.3	.4	3.3	17.6	23.8	39.8	.8	BB	(D)
Illinois -----	-	40	16	2.2	48.8	1.3	2.6	26.0	91.2	56.3	150.3	8.4	EE	(D)
Indiana -----	-	17	12	1.1	27.7	.6	1.3	12.9	40.4	26.0	66.8	1.4	.8	24.4
Iowa -----	-	8	3	.2	3.6	.1	.2	1.7	8.4	4.8	13.3	.2	.4	11.8
Massachusetts -----	-	18	9	.8	15.2	.5	1.1	8.2	30.8	23.5	55.3	1.6	BB	(D)
Michigan -----	-	49	27	2.1	55.5	1.4	2.8	31.6	97.2	85.2	205.6	5.5	1.4	54.2
Minnesota -----	-	17	7	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.7	25.0
Mississippi -----	-	3	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Missouri -----	E2	5	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Nebraska -----	E3	4	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New Hampshire -----	-	4	4	.4	8.9	.2	.3	2.4	22.6	12.2	35.3	2.0	BB	(D)
New Jersey -----	-	25	12	.7	13.3	.5	.8	7.2	24.7	14.2	40.4	.8	1.5	35.1
New York -----	-	26	13	2.1	48.1	1.4	3.1	29.9	83.7	58.4	146.8	6.5	1.8	56.9
Ohio -----	-	42	20	1.6	34.5	1.0	2.1	18.9	65.1	50.6	116.6	3.3	1.9	59.4
Pennsylvania -----	-	22	8	.9	18.6	.6	1.2	11.4	41.8	27.7	70.3	(D)	EE	(D)
South Dakota -----	-	3	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Tennessee -----	-	4	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Texas -----	-	14	8	1.5	27.2	1.0	1.8	14.4	60.5	44.5	104.0	5.8	EE	(D)
Wisconsin -----	-	13	9	1.4	33.5	.8	1.6	16.4	58.2	37.2	104.5	1.6	1.0	29.0

Note: For qualifications of data, see footnotes on table 1a.

¹Payroll and sales data for some small single-unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at time data were tabulated. The following symbols are shown for those States where estimated data based on administrative records data account for 10 percent or more of figures shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

²Includes establishments with payroll at any time during year.

³Statistics for some producing States have been withheld to avoid disclosing data for individual companies. However, for States with 150 employees or more, number of establishments is shown and employment size range is indicated by one of the following symbols: AA—150 to 249 employees; BB—250 to 499 employees; CC—500 to 999 employees; EE—1,000 to 2,499 employees; FF—2,500 employees or more.

⁴Beginning in 1982, all respondents were requested to report their inventories at cost or market prior to adjustment to LIFO cost. This is a change from prior years in which respondents were permitted to value their inventories using any generally accepted accounting method. Consequently, data for inventories and value added by manufacture are not comparable to prior-year data.

Table 3a. Summary Statistics for the Industry: 1982

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Machine tools, metal cutting types (SIC 3541)	Machine tools, metal forming types (SIC 3542)	Special dies, tools, jigs, and fixtures (SIC 3544)	Machine tool accessories (SIC 3545)	Power driven hand tools (SIC 3546)	Rolling mill machinery (SIC 3547)	Metalworking machinery, n.e.c. (SIC 3549)
Companies ¹ number..	864	434	7 131	1 444	180	58	421
All establishments ² do..	940	452	7 255	1 620	203	63	446
With 1 to 19 employees do..	647	290	5 933	1 058	129	31	249
With 20 to 99 employees do..	195	117	1 232	449	33	16	139
With 100 employees or more..... do..	98	45	90	113	41	16	58
All employees:							
Average for year 1,000..	58.1	19.5	102.9	55.1	21.6	5.1	20.7
Annual payroll ³ mil. dol..	1 331.7	438.1	2 293.3	1 069.4	393.6	125.1	431.5
Production workers:							
Average for year 1,000..	33.7	12.1	81.7	38.8	14.5	3.3	13.0
March do..	38.8	13.7	83.7	43.4	16.0	3.5	14.0
May do..	35.7	12.5	82.5	40.3	15.1	3.4	13.3
August do..	32.1	11.6	80.7	37.0	14.1	3.3	12.9
November do..	28.2	10.6	79.7	34.6	13.0	3.0	11.8
Hours..... millions..	63.4	23.2	164.9	73.5	25.9	6.1	25.4
January to March do..	19.0	6.7	41.8	21.1	7.4	1.7	6.9
April to June do..	17.2	6.1	41.9	19.5	6.7	1.6	6.6
July to September do..	14.5	5.3	40.2	16.7	5.9	1.4	6.0
October to December do..	12.6	5.1	40.1	16.1	5.9	1.4	5.9
Wages mil. dol..	707.2	245.3	1 684.9	690.1	228.6	70.8	233.3
Value added by manufacture ⁴ do..	2 554.5	777.8	3 780.5	2 162.9	940.3	276.4	830.3
Cost of materials, etc. ⁵ do..	1 589.5	574.6	1 535.4	979.9	791.5	246.8	600.0
Materials, parts, containers, etc., consumed do..	1 380.0	512.8	1 131.6	778.8	652.3	187.3	494.5
Resales do..	68.3	17.0	49.6	83.8	106.0	32.9	37.8
Fuels consumed ⁶ do..	19.6	8.3	28.8	13.2	5.0	4.2	5.4
Purchased electric energy ⁷ do..	39.8	14.1	59.3	44.5	16.1	5.8	12.4
Contract work do..	81.7	22.5	265.7	59.5	12.1	16.6	50.1
Value of shipments, including resales do..	4 440.2	1 428.7	5 374.9	3 163.9	1 795.3	502.9	1 471.5
Value of resales do..	91.3	21.6	80.1	115.6	139.2	41.5	50.4
Manufacturers' inventories (see tables 3b and 3c)							
Capital expenditures for plant and equipment ⁸ do..	170.4	52.7	274.2	157.2	88.2	22.7	55.4
New capital expenditures do..	157.1	43.4	232.9	144.0	68.1	14.8	52.4
New buildings and other structures do..	36.6	5.5	31.3	20.4	8.5	4.1	18.5
New machinery and equipment do..	120.6	37.8	201.5	123.6	59.7	10.7	33.9
Used capital expenditures do..	13.3	9.4	41.4	13.3	20.1	8.0	3.1
Primary product specialization ratio ⁹ percent..	91	89	94	92	88	79	86
Coverage ratio ¹⁰ do..	93	87	79	89	91	79	85

¹For the census, a company is defined as a business organization consisting of one establishment or more under common ownership or control.

²Includes establishments with payroll at any time during year.

³Data on supplemental labor costs are not included in annual payroll, but are shown in table 3d.

⁴Value added by manufacture is computed using inventory data reported on a cost or market basis prior to any adjustment to LIFO cost. See table 3b, footnote 1 for further explanation.

⁵Data on purchased services for the repair of buildings and machinery and for communication services are not included in cost of materials, etc., but are shown in table 3d.

⁶Data on purchased fuels by type were not collected for 1982. See MC82-S-4, Fuels and Electric Energy Consumed, for 1981 data on purchased fuels by type.

⁷Data on quantity of electric energy used for heat and power are included in table 3d.

⁸Data on capital expenditures for new machinery and equipment by type, depreciable assets, retirements, rental payments, and depreciation are included in table 3d.

⁹Represents ratio of primary product shipments to total product shipments (primary and secondary, excluding miscellaneous receipts) for establishments classified in industry.

¹⁰Represents ratio of primary products shipped by establishments classified in industry to total shipments of such products by all manufacturing establishments, wherever classified.

Table 3b. Value of Inventories for the Industry: End of 1981 and 1982

[Million dollars. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Machine tools, metal cutting types (SIC 3541)		Machine tools, metal forming types (SIC 3542)		Special dies, tools, jigs, and fixtures (SIC 3544)		Machine tool accessories (SIC 3545)	
	End of 1981	End of 1982	End of 1981	End of 1982	End of 1981	End of 1982	End of 1981	End of 1982
Total inventories¹	1 764.9	1 431.6	594.2	511.5	677.9	621.8	952.5	905.5
Detail by method of valuation:								
Subject to LIFO costing ²	897.9	759.0	204.5	202.2	93.3	87.9	376.8	361.7
LIFO reserve	299.9	283.0	77.8	87.9	21.8	22.0	141.9	138.3
LIFO value	598.0	475.9	126.6	114.4	71.5	65.8	235.0	223.4
Not subject to LIFO costing	719.9	536.9	327.4	251.3	310.8	280.8	412.5	390.3
Valuation method not reported ³	127.6	113.6	61.6	57.6	265.7	246.5	154.1	145.2
Amount subject to LIFO reported without associated reserve and value ⁴	19.4	22.1	.8	.4	8.1	6.7	9.0	8.3
Detail by stage of fabrication:								
Finished goods	343.6	355.6	163.5	145.4	105.1	93.8	362.9	393.7
Work in process	1 117.4	809.5	295.8	237.6	417.4	370.0	367.4	315.5
Materials and supplies	303.8	266.5	134.9	128.5	155.2	158.0	222.2	196.3

See footnotes at end of table.

Table 3b. Value of Inventories for the Industry: End of 1981 and 1982—Con.

[Million dollars. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Power driven hand tools (SIC 3546)		Rolling mill machinery (SIC 3547)		Metalworking machinery, n.e.c. (SIC 3549)	
	End of 1981	End of 1982	End of 1981	End of 1982	End of 1981	End of 1982
Total Inventories¹	487.2	415.0	147.3	168.1	395.3	337.6
Detail by method of valuation:						
Subject to LIFO costing ²	226.8	192.5	(D)	(D)	115.8	99.1
LIFO reserve	73.0	64.3	(D)	(D)	36.8	32.7
LIFO value	153.8	128.2	(D)	(D)	79.0	66.4
Not subject to LIFO costing	244.6	207.8	127.7	148.8	206.0	168.0
Valuation method not reported ³	15.8	14.7	(D)	(D)	72.1	68.4
Amount subject to LIFO reported without associated reserve and value ⁴	-	-	-	-	1.4	2.0
Detail by stage of fabrication:						
Finished goods	219.6	177.0	10.0	10.9	88.3	93.1
Work in process	144.4	123.4	115.0	134.4	201.3	155.5
Materials and supplies	123.2	114.6	22.3	22.8	105.6	89.1

¹Effective with the 1982 Economic Censuses, uniform instructions for reporting inventories were introduced for all sector reports. Prior to 1982, respondents were permitted to value inventories using any generally accepted accounting method (LIFO, FIFO, market, to name a few). In 1982, all respondents were requested to report inventories at cost or market. LIFO users were asked to first report inventory values prior to the LIFO adjustment and then to report the LIFO reserve and the LIFO value after adjustment for the reserve. For further explanation, see inventories in appendixes.

²Only includes data reported by respondents who (a) indicated amount of inventories subject to LIFO cost, and (b) provided sufficient information to determine associated LIFO reserve and value figures.

³Includes data estimated for nonresponse and nonmail administrative records and data reported by respondents who provided total inventory figures without other information.

⁴Includes data reported by respondents who indicated their inventories were subject to LIFO cost, but did not provide associated LIFO reserve and value figures.

Table 3c. Inventories by Specific Method of Valuation for the Industry: End of 1982

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Machine tools, metal cutting types (SIC 3541)		Machine tools, metal forming types (SIC 3542)		Special dies, tools, jigs, and fixtures (SIC 3544)		Machine tool accessories (SIC 3545)	
	Percent of total	Absolute standard error (percent)	Percent of total	Absolute standard error (percent)	Percent of total	Absolute standard error (percent)	Percent of total	Absolute standard error (percent)
Total Inventories	100.0	(X)	100.0	(X)	100.0	(X)	100.0	(X)
Last-In, First-Out (LIFO) methods	53.0	(X)	39.5	(X)	14.1	(X)	39.9	(X)
Non-LIFO methods	37.5	(X)	49.1	(X)	45.2	(X)	43.1	(X)
Cost basis:								
First-In, First-Out (FIFO)	10.6	.6	23.9	3.5	12.9	2.0	18.2	1.8
Average cost	3.3	1.0	4.1	.6	5.9	1.0	4.2	1.9
Specific or actual cost	10.3	1.0	9.7	2.0	17.5	2.0	8.4	1.5
Standard cost	13.3	.7	11.2	1.6	5.7	2.4	11.5	1.2
Other	(Z)	(Z)	.2	(Z)	2.3	.4	(S)	(S)
Market basis:								
Market lower than cost	(Z)	(Z)	(Z)	(Z)	.4	.2	(Z)	(Z)
Market always used	(Z)	(Z)	(Z)	(Z)	.3	.1	.1	(Z)
Valuation method not reported	7.9	(X)	11.3	(X)	39.6	(X)	16.0	(X)
Amount subject to LIFO reported without associated reserve and value	1.5	(X)	.1	(X)	1.1	(X)	.9	(X)

Item	Power driven hand tools (SIC 3546)		Rolling mill machinery (SIC 3547)		Metalworking machinery, n.e.c. (SIC 3549)	
	Percent of total	Absolute standard error (percent)	Percent of total	Absolute standard error (percent)	Percent of total	Absolute standard error (percent)
Total Inventories	100.0	(X)	100.0	(X)	100.0	(X)
Last-In, First-Out (LIFO) methods	46.4	(X)	(D)	(X)	29.4	(X)
Non-LIFO methods	50.1	(X)	88.5	(X)	49.8	(X)
Cost basis:						
First-In, First-Out (FIFO)	17.1	.6	27.2	10.0	14.7	2.4
Average cost	(Z)	(Z)	1.6	.7	5.3	2.5
Specific or actual cost	2.3	.2	39.7	6.8	11.5	1.4
Standard cost	25.4	.9	19.9	5.0	16.8	2.9
Other	5.2	1.4	.1	(Z)	.7	.1
Market basis:						
Market lower than cost .....	.1	(Z)	(Z)	(Z)	.6	.2
Market always used	(Z)	(Z)	(Z)	(Z)	.2	.1
Valuation method not reported	3.5	(X)	(D)	(X)	20.3	(X)
Amount subject to LIFO reported without associated reserve and value	(Z)	(X)	(Z)	(X)	.6	(X)

Note: The percentages shown for the LIFO and non-LIFO totals and the categories "valuation method not reported" and "amount subject to LIFO reported..." are based on the census universe estimates included in table 3b. The percentages shown for the specific non-LIFO methods of valuation (e.g., FIFO, etc.) are based on a representative sample of establishments included in the annual survey of manufactures (ASM) panel for 1982 (see appendixes for description of ASM). The absolute standard error of each of the ASM estimates is shown above.

Table 3d. Supplemental Industry Statistics Based on Sample Estimates: 1982

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Machine tools, metal cutting types (SIC 3541)		Machine tools, metal forming types (SIC 3542)		Special dies, tools, jigs, and fixtures (SIC 3544)		Machine tool accessories (SIC 3545)	
	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)
Supplemental labor costs:								
Total	329.2	2	113.1	2	388.7	3	252.1	2
Legal costs	118.8	4	41.1	2	176.3	2	92.2	2
Voluntary costs	210.4	3	71.9	4	212.4	4	160.0	3
Purchased services:								
Cost of purchased services for the repair of—								
Buildings and other structures	10.8	6	2.1	11	6.3	9	4.5	8
Response coverage ratio (percent) ²	82.4	(X)	73.5	(X)	55.1	(X)	82.4	(X)
Machinery	12.6	4	6.2	13	19.6	8	19.3	10
Response coverage ratio (percent) ²	85.3	(X)	74.9	(X)	64.6	(X)	83.2	(X)
Cost of purchased communication services	18.7	5	6.4	8	11.7	9	14.2	8
Response coverage ratio (percent) ²	89.2	(X)	83.1	(X)	63.6	(X)	84.9	(X)
Electric energy used for heat and power:								
Purchased:								
Quantity (million kWh)	677.9	1	254.6	2	971.0	2	759.6	2
Cost	39.8	(X)	14.1	(X)	59.3	(X)	44.5	(X)
Generated less sold (million kWh)	(S)	(S)	-	-	2.2	23	1.0	1
Gross book value of depreciable assets:								
Total:								
Beginning of year	1 598.6	3	725.4	6	2 239.6	4	1 312.2	4
New capital expenditures	145.8	4	35.7	10	193.1	11	131.2	10
Used capital expenditures	13.2	10	7.1	10	21.5	7	9.5	32
Retirements	75.6	10	26.4	9	84.2	15	42.5	12
End of year	1 682.0	3	741.6	6	2 370.0	4	1 410.3	4
Buildings and other structures:								
Beginning of year	449.0	2	205.2	6	388.2	6	335.5	5
New capital expenditures	31.4	5	3.8	21	27.8	19	18.6	24
Used capital expenditures	7.3	17	.7	1	5.1	6	.5	38
Retirements	14.6	25	7.5	10	12.4	24	5.1	14
End of year	473.1	2	202.2	6	408.7	6	349.6	6
Machinery and equipment:								
Beginning of year	1 149.6	3	520.2	7	1 851.5	4	976.7	4
New capital expenditures	114.4	5	31.9	10	165.2	11	112.6	11
Automobiles, trucks, etc., for highway use	2.9	24	.7	13	7.8	15	2.8	15
Computers and peripheral data processing equipment	10.1	17	1.9	10	8.2	39	4.6	29
All other	95.2	4	21.5	8	92.1	10	92.8	12
New machinery and equipment, n.s.k. ³	6.1	(S)	7.8	(S)	57.4	(S)	12.4	(S)
Used capital expenditures	6.0	5	6.4	11	16.4	9	9.0	33
Retirements	61.0	7	18.9	8	71.8	16	37.5	14
End of year	1 209.0	3	539.5	7	1 961.3	4	1 060.8	4
Rental payments:								
Total	30.9	4	9.3	8	62.4	10	24.6	11
Buildings and other structures	8.4	12	3.2	14	37.0	9	10.0	18
Machinery and equipment	22.5	3	6.1	7	25.3	17	14.7	10
Depreciation charges during 1982:								
Total	117.0	15	49.7	9	193.4	4	100.7	4
Buildings and other structures	19.5	11	6.6	15	21.8	9	14.0	6
Machinery and equipment	97.4	16	43.1	9	171.6	4	86.6	5
Item	Power driven hand tools (SIC 3546)		Rolling mill machinery (SIC 3547)		Metalworking machinery, n.e.c. (SIC 3549)			
	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)
Supplemental labor costs:								
Total	95.5	1	34.6	4	89.3	2		
Legal costs	37.2	1	12.4	2	35.1	3		
Voluntary costs	58.4	1	22.2	5	54.3	3		
Purchased services:								
Cost of purchased services for the repair of—								
Buildings and other structures	1.4	1	.6	12	2.9	9		
Response coverage ratio (percent) ²	86.3	(X)	82.4	(X)	76.0	(X)		
Machinery	6.2	1	2.6	5	5.7	17		
Response coverage ratio (percent) ²	80.7	(X)	82.3	(X)	75.5	(X)		
Cost of purchased communication services	6.0	2	1.6	13	6.7	13		
Response coverage ratio (percent) ²	96.6	(X)	82.9	(X)	75.8	(X)		
Electric energy used for heat and power:								
Purchased:								
Quantity (million kWh)	357.2	1	91.9	1	192.3	2		
Cost	16.1	(X)	5.8	(X)	12.4	(X)		
Generated less sold (million kWh)	-	-	-	-	.2	73		
Gross book value of depreciable assets:								
Total:								
Beginning of year	604.0	1	169.3	7	436.8	6		
New capital expenditures	66.3	3	18.3	50	43.4	7		
Used capital expenditures	6.4	7	8.5	7	6.2	55		
Retirements	57.6	2	20.8	1	11.8	35		
End of year	619.0	1	175.3	3	474.7	6		

See footnotes at end of table.

Table 3d. Supplemental Industry Statistics Based on Sample Estimates: 1982—Con.

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Power driven hand tools (SIC 3546)		Rolling mill machinery (SIC 3547)		Metalworking machinery, n.e.c. (SIC 3549)	
	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)
Gross book value of depreciable assets—Con.						
Buildings and other structures:						
Beginning of year	147.1	2	40.6	8	143.8	5
New capital expenditures	8.2	3	4.1	42	12.5	2
Used capital expenditures .....	.4	1	(Z)	1	2.7	87
Retirements	7.7	3	3.2	1	3.8	80
End of year	148.1	2	41.5	6	155.3	4
Machinery and equipment:						
Beginning of year	456.9	1	128.7	6	293.0	7
New capital expenditures	58.1	3	14.2	53	30.8	10
Automobiles, trucks, etc., for highway use .....	.5	18	.2	27	3.5	56
Computers and peripheral data processing equipment .....	.9	14	.2	20	2.2	16
All other	54.7	2	6.0	7	19.8	9
New machinery and equipment, n.s.k. ³	1.9	(S)	7.8	(S)	5.3	(S)
Used capital expenditures	6.0	7	8.5	7	3.5	32
Retirements	50.0	2	17.6	2	8.0	16
End of year	471.0	1	133.8	3	319.4	7
Rental payments:						
Total	11.9	3	3.5	23	11.0	8
Buildings and other structures	2.6	12	1.4	32	4.7	17
Machinery and equipment	9.3	2	2.1	18	6.3	12
Depreciation charges during 1982:						
Total	47.7	2	8.0	6	35.9	6
Buildings and other structures	5.0	3	1.3	11	8.9	4
Machinery and equipment	42.7	2	6.7	5	27.0	7

Note: Data for total new capital expenditures, new building expenditures, new machinery expenditures, and total used expenditures are also shown in table 3a. Data in table 3a are census universe totals and may differ from annual survey of manufactures (ASM) sample estimates shown in this table. Data in this table represent best estimates of year-to-year change as measured by the continuing ASM sample. However, they are subject to sampling error and, hence, as estimates of level, are not as reliable as universe figures shown in table 3a.

¹For description of relative standard error of estimate, see Qualifications of the Data in appendixes.

²Measure of extent to which respondents reported each item. Derived for each item by calculating the ratio of weighted employment for those sample establishments that reported the specific inquiry to weighted total employment for all sample establishments classified in industry. (See appendixes for explanation of sample weight.)

³Represents total machinery and equipment expenditures for establishments that did not break down their expenditures by specific type.

Table 4. Industry Statistics by Employment Size of Establishment: 1982

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and employment size class	E ¹	All estab- lish- ments (no.)	All employees		Production workers			Value added by manufac- ture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expend- itures (million dollars)	End-of- year invento- ries (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
INDUSTRY 3541, MACHINE TOOLS, METAL CUTTING TYPES												
Total	-	940	58.1	1 331.7	33.7	63.4	707.2	2 554.5	1 589.5	4 440.2	157.1	1 431.6
Establishments with an average of—												
1 to 4 employees	E9	295	.6	9.9	.4	.8	6.3	22.5	13.4	36.5	1.4	10.9
5 to 9 employees	E8	202	1.4	22.2	.9	1.9	13.1	48.1	28.7	78.1	2.9	22.1
10 to 19 employees	E4	150	2.0	32.8	1.3	2.7	19.5	62.0	43.0	105.9	3.6	28.4
20 to 49 employees	E1	122	3.8	80.3	2.5	4.9	48.2	162.8	115.0	289.5	6.4	80.7
50 to 99 employees	-	73	4.9	115.5	3.0	6.0	63.7	209.3	153.6	380.3	12.8	109.9
100 to 249 employees	-	45	7.0	155.8	4.4	8.8	90.1	317.0	205.9	555.8	23.9	145.0
250 to 499 employees	-	22	7.5	189.6	4.4	8.3	94.8	304.9	261.0	625.6	14.4	221.9
500 to 999 employees	-	24	16.7	396.8	9.6	17.8	215.1	761.3	492.1	1 369.2	39.8	521.1
1,000 to 2,499 employees	-	6	14.2	328.8	7.2	12.2	156.5	666.7	276.9	999.3	52.0	291.6
2,500 employees or more	-	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ²	E9	545	2.9	40.4	1.9	3.9	24.3	86.1	52.0	141.3	5.6	41.0
INDUSTRY 3542, MACHINE TOOLS, METAL FORMING TYPES												
Total	E1	452	19.5	438.1	12.1	23.2	245.3	777.8	574.6	1 428.7	43.4	511.5
Establishments with an average of—												
1 to 4 employees	E9	138	.3	5.0	.2	.4	3.1	10.2	7.4	18.0	.7	5.5
5 to 9 employees	E8	77	.5	7.8	.3	.7	4.6	15.0	9.8	24.9	1.0	7.4
10 to 19 employees	E5	75	1.0	19.0	.7	1.4	11.8	37.0	30.5	69.5	2.4	16.0
20 to 49 employees	E2	80	2.4	48.4	1.7	3.2	29.3	86.7	63.9	153.8	6.4	43.0
50 to 99 employees	-	37	2.7	56.7	1.7	3.4	33.2	102.5	67.5	179.7	2.8	64.3
100 to 249 employees	-	30	4.9	112.3	3.0	5.9	63.6	202.0	138.1	357.2	16.3	107.9
250 to 499 employees	-	7	2.2	53.6	1.2	2.5	30.2	105.6	77.5	201.9	4.0	69.3
500 to 999 employees	-	7	5.4	135.3	3.2	5.7	69.3	218.8	179.8	423.8	9.8	198.2
1,000 to 2,499 employees	-	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ²	E9	195	.9	13.2	.6	1.2	8.1	24.8	17.9	43.6	1.8	13.6

See footnotes at end of table.

Table 4. Industry Statistics by Employment Size of Establishment: 1982—Con.

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and employment size class	E ¹	All establishments (no.)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
INDUSTRY 3544, SPECIAL DIES, TOOLS, JIGS, AND FIXTURES												
Total.....	E1	7 255	102.9	2 293.3	81.7	164.9	1 684.9	3 780.5	1 535.4	5 374.9	232.9	621.8
Establishments with an average of—												
1 to 4 employees.....	E8	2 519	5.3	88.3	4.3	8.7	72.3	173.3	75.9	251.2	12.2	27.5
5 to 9 employees.....	E4	1 799	12.2	219.0	9.8	19.6	164.8	359.8	159.3	523.1	25.4	44.0
10 to 19 employees.....	E2	1 615	22.0	452.8	17.4	34.3	335.3	718.0	291.0	1 011.9	49.0	87.4
20 to 49 employees.....	E1	976	28.8	657.3	22.8	46.6	472.4	1 044.6	422.6	1 475.4	68.0	160.2
50 to 99 employees.....	E1	256	16.9	413.4	13.5	28.3	302.1	698.9	269.6	989.6	40.8	112.1
100 to 249 employees.....	-	76	10.6	258.5	8.2	16.0	183.5	448.7	204.0	669.7	30.5	127.0
250 to 499 employees.....	-	9	2.8	79.9	2.3	4.7	59.8	113.3	46.8	162.8	4.8	34.9
500 to 999 employees.....	-	3	4.4	124.0	3.4	6.6	94.7	223.7	66.2	291.1	2.0	28.8
1,000 to 2,499 employees.....	-	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ²	E9	2 970	9.8	137.6	7.9	15.8	106.6	256.4	111.8	371.1	18.1	42.8
INDUSTRY 3545, MACHINE TOOL ACCESSORIES												
Total.....	E1	1 620	55.1	1 069.4	38.8	73.5	690.1	2 162.9	979.9	3 163.9	144.0	905.5
Establishments with an average of—												
1 to 4 employees.....	E9	425	.9	13.9	.6	1.2	9.7	31.7	17.3	49.8	3.8	11.6
5 to 9 employees.....	E6	294	2.0	32.9	1.5	2.9	22.1	63.6	31.4	95.3	5.8	20.0
10 to 19 employees.....	E3	339	4.7	83.5	3.5	6.7	54.9	164.0	77.7	245.6	9.3	42.4
20 to 49 employees.....	E1	320	9.4	184.9	7.0	13.5	124.7	367.2	182.1	558.0	20.5	97.1
50 to 99 employees.....	E1	129	8.8	180.1	6.3	12.2	116.2	340.5	162.8	502.5	27.3	140.1
100 to 249 employees.....	-	74	11.2	211.1	7.7	14.5	131.0	443.9	225.8	679.0	29.1	213.2
250 to 499 employees.....	-	30	10.6	204.0	7.3	13.8	136.2	468.8	178.2	642.0	30.9	207.9
500 to 999 employees.....	-	7	7.6	159.1	4.9	8.7	95.3	283.1	104.6	391.7	17.3	173.2
1,000 to 2,499 employees.....	-	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ²	E9	524	2.1	28.3	1.5	3.0	19.1	63.2	34.4	99.3	4.9	23.8
INDUSTRY 3546, POWER DRIVEN HAND TOOLS												
Total.....	-	203	21.6	393.6	14.5	25.9	228.6	940.3	791.5	1 795.3	68.1	415.0
Establishments with an average of—												
1 to 4 employees.....	E9	64	.1	2.0	.1	.2	1.4	4.7	3.5	8.3	.3	1.9
5 to 9 employees.....	E5	33	.2	3.2	.2	.3	2.1	8.6	6.1	16.3	.7	3.4
10 to 19 employees.....	E7	32	.5	7.4	.3	.6	4.6	16.0	11.5	27.8	1.0	6.8
20 to 49 employees.....	E2	21	.7	15.1	.5	.9	6.4	31.0	19.2	42.6	2.3	15.9
50 to 99 employees.....	E1	12	.8	15.4	.6	1.1	9.5	37.0	43.8	82.6	.8	16.2
100 to 249 employees.....	-	16	2.6	52.4	1.6	3.0	30.4	85.5	53.2	154.5	6.4	67.7
250 to 499 employees.....	-	10	3.3	58.8	2.2	4.1	30.6	125.4	182.6	320.2	11.0	83.3
500 to 999 employees.....	-	10	6.8	125.0	4.6	8.0	75.5	357.7	268.0	640.7	24.2	104.8
1,000 to 2,499 employees.....	-	5	6.7	114.4	4.4	7.6	68.4	274.4	203.5	502.4	21.5	115.0
Covered by administrative records ²	E9	84	.5	6.6	.4	.7	4.3	17.1	13.5	31.0	1.1	7.2
INDUSTRY 3547, ROLLING MILL MACHINERY												
Total.....	-	63	5.1	125.1	3.3	6.1	70.8	276.4	246.8	502.9	14.8	168.1
Establishments with an average of—												
1 to 4 employees.....	E7	10	(Z)	.5	(Z)	(Z)	.3	1.1	1.4	2.6	.4	.5
5 to 9 employees.....	E6	13	.1	1.3	.1	.1	.8	3.0	2.5	5.5	.2	1.3
10 to 19 employees.....	E8	8	.1	1.4	.1	.1	1.0	2.9	2.6	5.5	.1	1.1
20 to 49 employees.....	E1	13	.4	9.9	.3	.6	5.8	19.8	14.0	34.6	2.0	7.4
50 to 99 employees.....	-	3	.2	6.0	.1	.2	2.3	9.8	11.2	21.4	.1	5.0
100 to 249 employees.....	-	11	1.7	42.4	1.0	1.9	23.1	94.9	91.5	174.1	5.5	101.3
250 to 499 employees.....	-	3	2.6	63.7	1.7	3.2	37.5	145.0	123.6	259.2	6.4	51.5
500 to 999 employees.....	-	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ²	E9	18	.1	1.7	.1	.1	1.0	4.8	4.2	9.1	.1	2.1
INDUSTRY 3549, METALWORKING MACHINERY, N.E.C.												
Total.....	-	446	20.7	431.5	13.0	25.4	233.3	830.3	600.0	1 471.5	52.4	337.6
Establishments with an average of—												
1 to 4 employees.....	E9	80	.2	2.4	.1	.2	1.5	5.0	3.9	9.1	.3	2.4
5 to 9 employees.....	E6	76	.5	8.0	.3	.7	4.7	15.3	11.2	26.6	1.6	6.0
10 to 19 employees.....	E2	93	1.3	22.5	.9	1.7	13.4	42.6	28.0	68.9	2.3	16.1
20 to 49 employees.....	E2	85	2.5	49.6	1.7	3.3	28.5	91.9	63.7	155.7	4.6	35.1
50 to 99 employees.....	E1	54	3.6	76.3	2.5	4.9	45.0	160.2	104.7	265.5	12.3	54.5
100 to 249 employees.....	-	44	6.4	130.8	3.9	7.4	70.1	273.2	234.9	522.4	13.0	125.9
250 to 499 employees.....	-	12	6.1	141.8	3.5	7.2	70.0	242.2	153.5	423.3	18.3	97.7
500 to 999 employees.....	-	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
1,000 to 2,499 employees.....	-	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ²	E9	109	.5	5.9	.3	.6	3.3	10.8	8.6	19.8	.8	5.2

Note: For qualifications of data, see footnotes on table 1a. Data shown as a (D) are included in underscored figures above.

¹Payroll and sales data for some small single-unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at time data were tabulated. The following symbols are shown for those States where estimated data based on administrative records data account for 10 percent or more of figures shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

²Report forms were not mailed to small single-unit companies with up to 20 employees (cutoff varied by industry). Payroll and sales data for 1982 were obtained from administrative records supplied by other agencies of the Federal Government. Those data were then used in conjunction with industry averages to estimate the items shown. Data are also included in respective size classes shown.

Table 5a. Industry Statistics by Industry and Primary Product Class Specialization: 1982

[Table presents selected statistics for establishments according to their degree of specialization in products primary to their industry. Measures of plant specialization shown are (1) industry specialization: ratio of primary product shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment; and (2) product class specialization: ratio of largest primary product class shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment. See appendix for method of computing ratios. Statistics for establishments with specialization ratios of less than 75 percent are included in total lines but are not shown as a separate class. In addition, data may not be shown for various reasons; e.g., to avoid disclosing data for individual companies. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes.]

Industry or product class code	Industry or product class by percent of specialization	All establishments (number)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
3541	Machine tools, metal cutting types:										
	Entire industry	940	58.1	1 331.7	33.7	63.4	707.2	2 554.5	1 589.5	4 440.2	157.1
	Establishments with 75 percent specialization or more ..	872	46.8	1 071.9	27.0	51.1	564.8	2 114.3	1 357.6	3 740.6	132.2
35411	Boring machines:										
	Establishments with this product class primary	16	2.9	81.3	1.7	3.4	41.9	137.4	106.3	262.5	8.5
	Establishments with 75 percent specialization or more in class	10	1.4	36.9	.9	1.6	19.2	58.8	54.0	123.1	2.8
35412	Drilling machines:										
	Establishments with this product class primary	22	1.0	21.4	.7	1.3	13.1	35.7	21.2	58.1	1.5
	Establishments with 75 percent specialization or more in class	5	.2	3.9	.1	.3	2.6	5.9	3.7	10.3	(D)
35413	Gear cutting machines:										
	Establishments with this product class primary	6	3.8	85.7	2.3	3.5	47.9	124.4	45.2	174.5	10.4
	Establishments with 75 percent specialization or more in class	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
35414	Grinding, polishing, honing, and lapping machines:										
	Establishments with this product class primary	48	8.4	179.2	5.1	9.6	97.7	369.7	176.6	543.6	21.9
	Establishments with 75 percent specialization or more in class	21	1.7	39.3	1.1	2.2	21.2	84.4	45.7	132.5	2.1
35415	Lathes:										
	Establishments with this product class primary	25	9.0	199.8	5.0	9.5	106.2	417.0	261.5	702.9	23.6
	Establishments with 75 percent specialization or more in class	12	4.0	84.7	2.3	4.2	46.3	165.7	109.2	296.9	11.2
35416	Milling machines:										
	Establishments with this product class primary	10	7.3	169.5	3.8	6.8	77.5	304.5	175.2	538.3	25.0
	Establishments with 75 percent specialization or more in class	6	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
35418	Machine tools for home workshops:										
	Establishments with this product class primary	23	.5	9.5	.3	.5	5.5	17.7	13.4	30.2	1.0
	Establishments with 75 percent specialization or more in class	18	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
35419	Parts for metal cutting machine tools:										
	Establishments with this product class primary	127	7.2	165.7	4.7	9.2	97.2	261.8	179.1	474.4	16.9
	Establishments with 75 percent specialization or more in class	80	3.1	64.2	2.2	4.3	40.8	117.7	68.0	186.8	11.9
3541A	Machining centers:										
	Establishments with this product class primary	11	3.8	88.3	1.8	3.5	40.3	249.0	125.2	377.9	12.3
	Establishments with 75 percent specialization or more in class	8	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3541B	Station type machines:										
	Establishments with this product class primary	29	7.1	201.2	3.8	7.1	107.4	379.1	321.1	842.4	24.9
	Establishments with 75 percent specialization or more in class	19	3.9	123.7	2.1	4.1	65.0	279.7	228.9	617.5	10.1
3541C	Metal cutting machine tools, n.e.c.:										
	Establishments with this product class primary	45	3.7	79.3	2.2	4.2	41.5	151.1	99.8	259.2	4.3
	Establishments with 75 percent specialization or more in class	23	1.7	37.8	1.0	2.0	18.7	73.4	63.1	141.0	2.6
3542	Machine tools, metal forming types:										
	Entire industry	452	19.5	438.1	12.1	23.2	245.3	777.8	574.6	1 428.7	43.4
	Establishments with 75 percent specialization or more ..	423	15.2	333.5	9.5	18.4	189.9	597.9	432.6	1 068.2	38.4
35421	Punching, shearing, bending, and forming machines:										
	Establishments with this product class primary	60	4.8	104.5	2.9	5.7	57.5	202.5	139.3	349.7	17.0
	Establishments with 75 percent specialization or more in class	42	2.5	51.1	1.5	2.9	27.6	97.8	84.3	187.3	11.7
35422	Presses, except forging:										
	Establishments with this product class primary	36	5.8	136.7	3.5	6.4	72.1	268.3	166.1	463.9	8.7
	Establishments with 75 percent specialization or more in class	15	1.2	26.3	.6	1.3	11.9	56.9	31.0	92.8	2.0
35423	Metal forming machine tools, n.e.c.:										
	Establishments with this product class primary	26	2.8	68.3	1.7	3.4	39.6	86.0	107.7	216.9	3.8
	Establishments with 75 percent specialization or more in class	11	1.5	36.1	1.0	2.0	21.7	34.5	64.3	105.6	1.0
35424	Parts for metal forming machines:										
	Establishments with this product class primary	61	4.1	95.0	2.6	5.0	54.7	159.2	121.7	294.9	9.2
	Establishments with 75 percent specialization or more in class	36	1.7	40.5	1.1	2.3	25.9	70.4	53.4	131.3	2.4
3544	Special dies, tools, jigs, and fixtures:										
	Entire industry	7 255	102.9	2 293.3	81.7	164.9	1 684.9	3 780.5	1 535.4	5 374.9	232.9
	Establishments with 75 percent specialization or more ..	6 916	91.1	2 024.8	72.4	147.1	1 492.2	3 337.2	1 324.0	4 708.2	209.9
35441	Special dies and tools, die sets, jigs, and fixtures:										
	Establishments with this product class primary	1 984	52.0	1 233.2	40.9	82.2	889.0	2 031.4	835.0	2 903.4	117.3
	Establishments with 75 percent specialization or more in class	1 648	41.3	989.0	32.5	65.9	712.8	1 621.2	651.7	2 299.7	94.8
35442	Industrial molds:										
	Establishments with this product class primary	1 174	28.4	699.9	22.7	47.4	524.8	1 132.9	438.5	1 587.6	73.1
	Establishments with 75 percent specialization or more in class	1 041	24.1	595.6	19.3	40.6	449.1	968.6	363.2	1 344.4	64.4
3545	Machine tool accessories:										
	Entire industry	1 620	55.1	1 069.4	38.8	73.5	690.1	2 162.9	979.9	3 163.9	144.0
	Establishments with 75 percent specialization or more ..	1 516	48.7	934.3	34.6	65.3	605.8	1 894.8	854.5	2 769.3	116.6
35451	Small cutting tools for machine tools:										
	Establishments with this product class primary	540	32.8	624.8	23.5	43.9	416.1	1 295.6	605.4	1 924.4	87.8
	Establishments with 75 percent specialization or more in class	464	26.8	503.2	19.6	36.5	341.5	1 046.1	497.4	1 566.3	63.7

See footnotes at end of table.

Table 5a. Industry Statistics by Industry and Primary Product Class Specialization: 1982—
Con.

[Table presents selected statistics for establishments according to their degree of specialization in products primary to their industry. Measures of plant specialization shown are (1) industry specialization: ratio of primary product shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment; and (2) product class specialization: ratio of largest primary product class shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment. See appendix for method of computing ratios. Statistics for establishments with specialization ratios of less than 75 percent are included in total lines but are not shown as a separate class. In addition, data may not be shown for various reasons; e.g., to avoid disclosing data for individual companies. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendices.]

Industry or product class code	Industry or product class by percent of specialization	All establishments (number)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
3545	Machine tool accessories—Con.										
35452	Precision measuring tools: Establishments with this product class primary ----- Establishments with 75 percent specialization or more in class -----	98 86	6.8 5.0	145.9 110.1	4.4 3.1	8.7 6.0	84.8 60.6	273.5 204.8	118.9 96.2	387.0 301.9	14.9 10.8
35453	Machine tool accessories, n.e.c.: Establishments with this product class primary ----- Establishments with 75 percent specialization or more in class -----	163 127	8.8 6.9	186.9 143.3	6.0 4.6	11.3 8.6	114.7 86.5	382.3 310.8	141.3 97.6	522.0 404.7	21.1 14.3
3546	Power driven hand tools: Entire industry ----- Establishments with 75 percent specialization or more ..	203 184	21.6 18.3	393.6 335.0	14.5 12.3	25.9 22.2	228.6 195.7	940.3 816.9	791.5 660.8	1 795.3 1 527.9	68.1 60.3
35461	Electric, including battery powered: Establishments with this product class primary ----- Establishments with 75 percent specialization or more in class -----	27 21	9.8 7.9	168.5 141.3	7.3 5.8	12.7 10.3	106.9 87.7	532.6 433.5	414.3 303.9	955.0 741.0	32.0 (D)
35462	Pneumatic, hydraulic, and powder-actuated: Establishments with this product class primary ----- Establishments with 75 percent specialization or more in class -----	46 38	7.2 5.4	149.2 111.3	4.2 3.2	7.7 6.0	77.1 60.3	266.8 231.8	117.4 91.5	385.5 316.0	13.7 (D)
35463	Engine (internal combustion) driven: Establishments with this product class primary ----- Establishments with 75 percent specialization or more in class -----	11 11	3.7 3.7	62.9 62.9	2.5 2.5	4.3 4.3	36.4 36.4	110.1 110.1	236.5 236.5	400.0 400.0	20.4 20.4
3547	Rolling mill machinery: Entire industry ----- Establishments with 75 percent specialization or more ..	63 45	5.1 2.5	125.1 65.2	3.3 1.5	6.1 2.9	70.8 33.1	276.4 146.0	246.8 104.3	502.9 223.0	14.8 5.0
35471	Hot rolling mill machinery, except tube rolling: Establishments with this product class primary ----- Establishments with 75 percent specialization or more in class -----	10 4	1.9 .6	42.7 16.2	1.1 .3	2.1 .6	23.0 7.0	93.4 45.5	94.4 41.3	169.1 75.5	2.2 .2
35472	Cold rolling mill machinery: Establishments with this product class primary ----- Establishments with 75 percent specialization or more in class -----	9 3	.6 (D)	15.7 (D)	.4 (D)	.7 (D)	9.3 (D)	21.5 (D)	23.6 (D)	50.3 (D)	1.9 (D)
35473	Rolling mill machinery, n.e.c.: Establishments with this product class primary ----- Establishments with 75 percent specialization or more in class -----	19 8	2.5 .3	63.7 6.8	1.6 .2	3.1 .4	36.5 4.2	155.4 13.9	122.7 11.9	271.1 25.7	10.5 .7
3549	Metalworking machinery, n.e.c.: Entire industry ----- Establishments with 75 percent specialization or more ..	446 374	20.7 14.5	431.5 296.1	13.0 8.6	25.4 16.5	233.3 148.4	830.3 599.1	600.0 429.1	1 471.5 1 052.7	52.4 41.0
35492	Assembly machines: Establishments with this product class primary ----- Establishments with 75 percent specialization or more in class -----	61 31	5.2 2.2	136.2 60.5	3.7 1.4	7.8 2.8	83.8 32.5	213.2 101.3	172.8 94.0	421.8 217.3	12.4 6.4
35494	Automotive maintenance equipment, except hand tools: Establishments with this product class primary ----- Establishments with 75 percent specialization or more in class -----	27 25	2.2 (D)	45.7 (D)	1.3 (D)	2.4 (D)	20.5 (D)	127.0 (D)	68.4 (D)	194.4 (D)	7.9 (D)
35495	Metalworking machinery, n.e.c.: Establishments with this product class primary ----- Establishments with 75 percent specialization or more in class -----	89 69	5.3 3.5	108.8 70.6	3.2 2.1	6.1 4.1	55.2 36.4	195.3 127.5	157.9 102.0	353.8 227.5	10.6 6.0
35496	Gas cutting and welding equipment: Establishments with this product class primary ----- Establishments with 75 percent specialization or more in class -----	38 30	3.5 3.0	61.5 53.0	2.3 1.9	4.3 3.6	34.4 28.8	136.5 117.1	98.6 77.4	233.2 192.5	13.5 13.3
35497	Other welding equipment: Establishments with this product class primary ----- Establishments with 75 percent specialization or more in class -----	19 15	1.9 (D)	39.9 (D)	.7 (D)	1.3 (D)	14.6 (D)	86.7 (D)	59.5 (D)	153.0 (D)	4.1 (D)

Note: For qualifications of data, see footnotes on table 1a.

Table 5b. Industry-Product Analysis—Value of Shipments and Primary Product Shipments, Specialization and Coverage Ratios for the Industry: 1982 and Earlier Census Years

[An establishment is assigned to an industry based on shipment values of products representing largest amount considered primary to an industry. Frequently, establishment shipments comprise mixtures of products assigned to an industry (primary), those considered primary to other industries (secondary), and receipts for activities such as merchandising or contract work. Columns A-D show this product pattern for an industry, and column E shows primary product specialization ratio. The extent to which an industry's primary products are shipped by establishments classified in and out of an industry is shown in columns F-H and coverage ratio is shown in column I. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and product group code	Industry and census year	Value of shipments					Value of primary product shipments			
		Total (million dollars)	Primary products (million dollars)	Secondary products (million dollars)	Miscellaneous receipts (million dollars)	Primary product specialization ratio Col. B ÷ Col. B + C (percent)	Total made in all industries (million dollars)	Made in this industry (million dollars)	Made in other industries (million dollars)	Coverage ratio Col. B ÷ Col. F (percent)
		A	B	C	D	E	F	G	H	I
3541	Machine tools, metal cutting types ----- 1982..	4 440.2	3 877.2	369.5	193.6	91	4 154.7	3 877.2	277.5	93
	1977..	2 812.7	2 353.9	337.0	121.8	87	2 560.5	2 353.9	206.6	92
	1972..	1 418.1	1 135.5	188.9	93.7	86	1 258.5	1 135.5	123.0	90
3542	Machine tools, metal forming types ----- 1982..	1 428.7	1 210.5	143.6	74.6	89	1 383.9	1 210.5	173.4	87
	1977..	1 130.6	967.1	111.6	51.9	90	1 114.7	967.1	147.6	87
	1972..	696.3	583.6	73.1	39.6	89	670.1	583.6	86.5	87
3544	Special dies, tools, jigs, and fixtures ----- 1982..	5 374.9	4 795.1	298.3	281.5	94	6 099.3	4 795.1	1 304.2	79
	1977..	3 905.3	3 498.4	219.0	187.9	94	4 450.2	3 498.4	951.8	79
	1972..	2 423.7	2 102.7	129.2	191.8	94	2 713.5	2 102.7	610.8	78
3545	Machine tool accessories ----- 1982..	3 163.9	2 740.5	241.5	181.9	92	3 069.1	2 740.5	328.6	89
	1977..	2 383.0	1 969.9	254.2	158.9	89	2 238.9	1 969.9	269.0	88
	1972..	1 243.4	1 002.6	164.7	76.1	86	1 151.4	1 002.6	148.8	87
3546	Power driven hand tools ----- 1982..	1 795.3	1 457.3	194.2	143.7	88	1 594.8	1 457.3	137.5	91
	1977..	1 623.2	1 349.8	126.0	147.5	91	1 496.5	1 349.8	146.7	90
	1972..	730.5	570.9	127.3	32.3	82	622.9	570.9	52.0	92
3547	Rolling mill machinery ----- 1982..	502.9	352.5	91.7	58.7	79	445.1	352.5	92.6	79
	1977..	507.4	309.5	87.4	110.6	78	361.0	309.5	51.5	86
	1972..	327.8	212.4	74.1	41.3	74	247.9	212.4	35.5	86
3549	Metalworking machinery, n.e.c. ----- 1982..	1 471.5	1 176.3	187.4	107.8	86	1 376.9	1 176.3	200.6	85
	1977..	916.8	742.7	104.1	70.0	88	908.9	742.7	166.2	82
	1972..	427.3	341.9	47.8	37.6	88	411.3	341.9	69.4	83

Table 5c-1. Industry-Product Analysis—Shipments by Product Class and Industry: 1982

[Million dollars. Table shows where products of an industry (referred to as primary and listed in table 6a) are made and what products are made by establishments classified in an industry. Read down an industry column to find what products are produced in an industry. Only those product groups that have at least \$2 million in shipments from establishments classified in one of industries included in this chapter are shown. Read across to determine where products of industries in this chapter are produced. To extent that some of primary products are made in industries not included in this chapter, value of such shipments is shown in "Other industries" column. Specified "Other industries" are listed in table 5c-2 if they account for more than \$5 million of products primary to this chapter. For meaning of abbreviations and symbols, see explanatory text. For explanation of terms, see appendixes]

1982 product code	Product group, product class, and miscellaneous receipts	All industries	Machine tools, metal cutting types (SIC 3541)	Machine tools, metal forming types (SIC 3542)	Special dies, tools, jigs, and fixtures (SIC 3544)	Machine tool accessories (SIC 3545)	Power driven hand tools (SIC 3546)	Rolling mill machinery (SIC 3547)	Metalworking machinery, n.e.c. (SIC 3549)	Other industries
	Total	(X)	4 440.2	1 428.7	5 374.9	3 163.9	1 795.3	502.9	1 471.5	(X)
	Primary products	(X)	3 877.2	1 210.5	4 795.1	2 740.5	1 457.3	352.5	1 176.3	(X)
	Secondary products	(X)	369.5	143.6	298.3	241.5	194.2	91.7	187.4	(X)
	Miscellaneous receipts	(X)	193.6	74.6	281.5	181.9	143.7	58.7	107.8	(X)
3541-	Machine tools, metal cutting types -----	4 154.7	3 877.2	25.2	3.6	75.4	(D)	(D)	31.3	135.5
35411	Boring machines -----	198.7	193.6	-	(D)	(D)	-	-	(D)	(D)
35412	Drilling machines -----	67.3	53.2	(D)	-	(D)	-	-	(D)	(D)
35413	Gear cutting machines -----	87.3	(D)	-	-	(D)	-	-	-	-
35414	Grinding, polishing, honing, and lapping machines -----	515.3	468.7	1.0	-	(D)	-	-	(D)	(D)
35415	Lathes -----	523.6	514.7	(D)	(D)	(D)	-	-	(D)	(D)
35416	Milling machines -----	264.5	251.1	9.5	-	(D)	-	-	(D)	(D)
3541A	Machining centers -----	365.7	361.1	(D)	-	-	-	-	-	(D)
3541B	Station type machines -----	735.4	730.0	(D)	(D)	(D)	-	-	(D)	(D)
3541C	Metal cutting machine tools, n.e.c. -----	250.6	207.7	3.7	(D)	22.5	-	(D)	(D)	(D)
35418	Machine tools for home workshops -----	85.7	29.0	(D)	-	-	(D)	(D)	(D)	42.9
35419	Parts for metal cutting machine tools -----	891.9	823.6	6.7	2.0	20.3	-	-	5.6	33.8
35410	Machine tools, metal cutting types, n.s.k. -----	168.7	(D)	-	-	-	-	-	-	(D)
3542-	Machine tools, metal forming types -----	1 383.9	42.7	1 210.5	8.7	(D)	(D)	20.4	(D)	86.1
35421	Punching, shearing, bending, and forming machines -----	317.3	(D)	286.9	(D)	-	-	(D)	3.6	18.5
35422	Presses, except forging -----	369.2	10.1	330.7	(D)	(D)	-	(D)	(D)	(D)
35423	Metal forming machine tools, n.e.c. -----	217.0	(D)	177.1	(D)	(D)	(D)	(D)	(D)	12.6
35424	Parts for metal forming machines -----	380.0	15.1	317.4	2.8	(D)	-	(D)	3.5	34.9
35420	Machine tools, metal forming types, n.s.k. -----	100.5	-	98.4	-	-	-	-	(D)	(D)
3544-	Special dies, tools, jigs, and fixtures -----	6 099.3	8.4	28.2	4 795.1	44.6	-	-	19.4	1 203.6
35441	Special dies and tools, die sets, jigs, and fixtures -----	3 425.9	(D)	(D)	2 515.9	42.9	-	-	8.6	822.7
35442	Industrial molds -----	1 800.6	(D)	(D)	1 429.0	.1	-	-	(D)	360.9
35440	Special dies, tools, jigs, and fixtures, n.s.k. -----	872.8	(D)	(D)	850.2	1.6	-	-	(D)	20.1
3545-	Machine tool accessories -----	3 069.1	154.0	.6	30.8	2 740.5	2.6	-	3.8	136.9
35451	Small cutting tools for machine tools -----	1 755.7	79.5	(D)	11.5	1 600.6	(D)	-	(D)	(D)
35452	Precision measuring tools -----	402.7	41.8	-	7.3	343.6	-	-	(D)	(D)
35453	Machine tool accessories, n.e.c. -----	593.6	32.7	(D)	10.8	486.7	(D)	-	(D)	60.8
35450	Machine tool accessories, n.s.k. -----	317.1	-	-	1.2	309.6	(D)	-	-	(D)

See footnotes at end of table.

Table 5c-1. Industry-Product Analysis—Shipments by Product Class and Industry: 1982—Con.

[Million dollars. Table shows where products of an industry (referred to as primary and listed in table 6a) are made and what products are made by establishments classified in an industry. Read down an industry column to find what products are produced in an industry. Only those product groups that have at least \$2 million in shipments from establishments classified in one of industries included in this chapter are shown. Read across to determine where products of industries in this chapter are produced. To extent that some of primary products are made in industries not included in this chapter, value of such shipments is shown in "Other industries" column. Specified "Other industries" are listed in table 5c-2 if they account for more than \$5 million of products primary to this chapter. For meaning of abbreviations and symbols, see explanatory text. For explanation of terms, see appendixes]

1982 product code	Product group, product class, and miscellaneous receipts	All industries	Machine tools, metal cutting types (SIC 3541)	Machine tools, metal forming types (SIC 3542)	Special dies, tools, jigs, and fixtures (SIC 3544)	Machine tool accessories (SIC 3545)	Power driven hand tools (SIC 3546)	Rolling mill machinery (SIC 3547)	Metalworking machinery, n.e.c. (SIC 3549)	Other industries
3546-	Power driven hand tools	1 594.8	(D)	(D)	-	-	1 457.3	-	-	(D)
35461	Electric, including battery powered	829.9	-	(D)	-	-	794.4	-	-	(D)
35462	Pneumatic, hydraulic, and powder-actuated	382.4	(D)	-	-	-	(D)	-	-	(D)
35463	Engine (internal combustion) driven	326.5	(D)	-	-	-	(D)	-	-	33.4
35460	Power driven hand tools, n.s.k.	56.0	-	-	-	-	51.8	-	-	4.2
3547-	Rolling mill machinery	445.1	(D)	(D)	-	(D)	-	352.5	(D)	49.5
35471	Hot rolling mill machinery, except tube rolling	180.5	-	(D)	-	-	-	152.6	-	(D)
35472	Cold rolling mill machinery	65.1	(D)	(D)	-	-	-	37.5	-	(D)
35473	Rolling mill machinery, n.e.c.	188.2	-	(D)	-	(D)	-	151.1	(D)	(D)
35470	Rolling mill machinery, n.s.k.	11.4	-	-	-	-	-	11.2	-	.2
3549-	Metalworking machinery, n.e.c.	1 376.9	(D)	6.6	7.4	(D)	(D)	(D)	1 176.3	133.6
35492	Assembly machines	367.6	26.4	(D)	(D)	-	-	(D)	320.5	18.9
35494	Automotive maintenance equipment, except hand tools	200.3	-	-	-	(D)	(D)	-	176.0	(D)
35495	Metalworking machinery, n.e.c.	330.3	(D)	(D)	6.6	.6	(D)	15.7	278.5	21.3
35496	Gas cutting and welding equipment	226.6	-	-	-	-	-	(D)	189.1	(D)
35497	Other welding equipment	152.7	(D)	(D)	-	-	-	-	114.9	(D)
35490	Metalworking machinery, n.e.c., n.s.k.	99.5	-	-	(D)	-	-	(D)	97.3	1.7
OTHER SHIPMENTS BY FOUR-DIGIT PRODUCT GROUP										
2899-	Chemical preparations, n.e.c.	(X)	(D)	-	-	(D)	-	-	(D)	(X)
3079-	Miscellaneous plastics products	(X)	(D)	(D)	15.8	-	-	-	(D)	(X)
3291-	Abrasive products	(X)	(D)	-	-	(D)	(D)	-	(D)	(X)
3312-	Blast furnaces and steel mills	(X)	(D)	(D)	(D)	(D)	-	(D)	-	(X)
3321-	Gray iron castings	(X)	10.6	(D)	(D)	-	-	(D)	(D)	(X)
3325-	Steel castings, n.e.c.	(X)	-	-	(D)	(D)	-	(D)	-	(X)
3398-	Metal heat treating	(X)	(D)	-	(D)	(D)	-	-	-	(X)
3399-	Primary metal products, n.e.c.	(X)	-	-	(D)	(D)	(D)	-	-	(X)
3423-	Hand and edge tools, n.e.c.	(X)	1.5	(D)	6.5	6.0	1.6	-	(D)	(X)
3425-	Hand saws and saw blades	(X)	(D)	-	-	(D)	23.4	-	-	(X)
3443-	Fabricated plate work (boiler shops)	(X)	-	-	(D)	-	-	(D)	(D)	(X)
3444-	Sheet metal work	(X)	(D)	-	1.1	(D)	-	-	-	(X)
3463-	Nonferrous forgings	(X)	-	-	(D)	-	-	-	-	(X)
3465-	Automotive stampings	(X)	(D)	-	18.5	(D)	-	-	-	(X)
3469-	Metal stampings, n.e.c.	(X)	(D)	(D)	28.8	-	-	-	(D)	(X)
3489-	Ordnance and accessories, n.e.c.	(X)	-	-	-	-	-	-	(D)	(X)
3494-	Valves and pipe fittings	(X)	(D)	-	(D)	(D)	-	-	(D)	(X)
3496-	Miscellaneous fabricated wire products	(X)	-	(D)	(D)	-	(D)	-	(D)	(X)
3499-	Fabricated metal products, n.e.c.	(X)	-	(D)	4.3	(D)	-	-	(D)	(X)
3519-	Internal combustion engines, n.e.c.	(X)	-	-	-	-	(D)	-	(D)	(X)
3524-	Lawn and garden equipment	(X)	-	-	-	-	(D)	-	-	(X)
3531-	Construction machinery	(X)	-	-	(D)	-	17.9	-	(D)	(X)
3532-	Mining machinery	(X)	(D)	-	(D)	(D)	(D)	(D)	-	(X)
3533-	Oil field machinery	(X)	-	-	(D)	(D)	-	(D)	-	(X)
3535-	Conveyors and conveying equipment	(X)	(D)	(D)	2.4	-	-	-	(D)	(X)
3553-	Woodworking machinery	(X)	4.5	1.8	-	4.6	7.1	-	-	(X)
3559-	Special industry machinery, n.e.c.	(X)	21.2	(D)	26.7	6.0	-	(D)	12.8	(X)
3561-	Pumps and pumping equipment	(X)	(D)	(D)	(D)	1.1	(D)	(D)	-	(X)
3564-	Blowers and fans	(X)	-	-	(D)	-	(D)	-	-	(X)
3565-	Industrial patterns	(X)	(D)	-	10.6	-	-	(D)	-	(X)
3568-	Power transmission equipment, n.e.c.	(X)	-	-	(D)	(D)	-	-	-	(X)
3569-	General industrial machinery, n.e.c.	(X)	5.8	-	4.6	.8	-	-	6.3	(X)
3599-	Machinery, except electrical, n.e.c.	(X)	8.8	(D)	36.4	12.4	(D)	(D)	10.7	(X)
3621-	Motors and generators	(X)	-	-	-	(D)	(D)	-	-	(X)
3622-	Industrial controls	(X)	.5	-	-	(D)	-	(D)	(D)	(X)
3623-	Welding apparatus, electric	(X)	(D)	(D)	(D)	(D)	-	(D)	16.8	(X)
3635-	Household vacuum cleaners	(X)	-	-	-	-	(D)	-	-	(X)
3643-	Current-carrying wiring devices	(X)	-	-	(D)	-	-	-	-	(X)
3648-	Lighting equipment, n.e.c.	(X)	-	-	-	-	(D)	-	-	(X)
3678-	Electronic connectors	(X)	-	-	(D)	-	-	-	-	(X)
3699-	Electrical equipment and supplies, n.e.c.	(X)	-	-	(D)	-	(D)	-	-	(X)
3711-	Motor vehicles and car bodies	(X)	-	-	(D)	-	-	-	-	(X)
3714-	Motor vehicle parts and accessories	(X)	-	-	(D)	-	-	-	(D)	(X)
3825-	Instruments to measure electricity	(X)	-	-	-	(D)	(D)	-	(Z)	(X)
3829-	Measuring and controlling devices, n.e.c.	(X)	-	(D)	(D)	(D)	-	-	(D)	(X)
3842-	Surgical appliances and supplies	(X)	-	-	.4	(D)	(D)	-	-	(X)
MISCELLANEOUS RECEIPTS										
93000 00	Receipts for work done for others on their materials	(X)	28.0	23.5	103.0	33.2	(D)	7.0	28.3	(X)
93000 35	Receipts for precision machining on materials owned by others	(X)	2.9	.7	39.3	9.9	-	(D)	7.2	(X)
99980 13	Sales of scrap and refuse	(X)	.6	(D)	1.7	1.5	.3	(D)	1.3	(X)
99980 31	Receipts for installation or construction of products of the establishment	(X)	5.7	3.8	.4	.1	-	(D)	.7	(X)
99980 41	Receipts for research and development work	(X)	.3	(D)	1.9	2.4	(Z)	-	(Z)	(X)
99980 61	Receipts for repair work	(X)	40.6	16.0	30.3	10.6	(D)	.8	14.0	(X)
99980 98	Other miscellaneous receipts, including receipts for repair work, etc.	(X)	22.3	6.9	13.4	8.0	(D)	.4	3.3	(X)
99980 00	Miscellaneous receipts, n.s.k.	(X)	1.8	(Z)	11.5	.5	(D)	(Z)	2.6	(X)
99989 00	Sales of products bought and resold without further manufacture, processing, or assembly at establishment	(X)	91.3	21.6	80.1	115.6	139.2	41.5	50.4	(X)

Table 5c-2. Industry—Product Analysis—Other Industries With Shipments of Primary Products: 1982

[Million dollars. Table is a continuation of table 5c-1 and shows where products of industries in this chapter (referred to as primary products and listed in table 6a) are made. To extent that some of primary products are made in industries not included in this chapter, value of such shipments is shown in "Other industries" column of table 5c-1. Specified "Other industries" are listed in this table if they account for more than \$5 million of products primary to this chapter. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

1982 product code	Other industries	Value	1982 product code	Other industries	Value
3541-	MACHINE TOOLS, METAL CUTTING TYPES		3545-	MACHINE TOOL ACCESSORIES	
3291	Abrasive products	(D)	3399	Primary metal products, n.e.c.	(D)
3423	Hand and edge tools, n.e.c.	(D)	3423	Hand and edge tools, n.e.c.	28.4
3524	Lawn and garden equipment	(D)	3425	Hand saws and saw blades	5.8
3533	Oil field machinery	(D)	3452	Bolts, nuts, rivets, and washers	6.2
3553	Woodworking machinery	28.5	3499	Fabricated metal products, n.e.c.	(D)
3559	Special industry machinery, n.e.c.	13.2	3519	Internal combustion engines, n.e.c.	(D)
3542-	MACHINE TOOLS, METAL FORMING TYPES		3599	Machinery, except electrical, n.e.c.	12.9
2396	Automotive and apparel trimmings	(D)	3546-	POWER DRIVEN HAND TOOLS	
3423	Hand and edge tools, n.e.c.	(D)	3423	Hand and edge tools, n.e.c.	17.7
3431	Metal sanitary ware	(D)	3425	Hand saws and saw blades	(D)
3494	Valves and pipe fittings	(D)	3452	Bolts, nuts, rivets, and washers	21.8
3559	Special industry machinery, n.e.c.	6.1	3496	Miscellaneous fabricated wire products	(D)
3623	Welding apparatus, electric	7.1	3519	Internal combustion engines, n.e.c.	(D)
3714	Motor vehicle parts and accessories	(D)	3524	Lawn and garden equipment	(D)
3544-	SPECIAL DIES, TOOLS, JIGS, AND FIXTURES		3586	Measuring and dispensing pumps	(D)
3079	Miscellaneous plastics products	211.6	3547-	ROLLING MILL MACHINERY	
3324	Steel investment foundries	19.9	3321	Gray iron foundries	(D)
3361	Aluminum foundries	82.2	3566	Speed changers, drives, and gears	(D)
3369	Nonferrous foundries, n.e.c.	13.2	3795	Tanks and tank components	(D)
3423	Hand and edge tools, n.e.c.	5.5	3549-	METALWORKING MACHINERY, N.E.C.	
3429	Hardware, n.e.c.	(D)	3452	Bolts, nuts, rivets, and washers	(D)
3462	Iron and steel forgings	24.5	3469	Metal stampings, n.e.c.	(D)
3463	Nonferrous forgings	16.7	3494	Valves and pipe fittings	(D)
3465	Automotive stampings	399.8	3559	Special industry machinery, n.e.c.	8.8
3469	Metal stampings, n.e.c.	109.6	3586	Measuring and dispensing pumps	(D)
3559	Special industry machinery, n.e.c.	29.2	3599	Machinery, except electrical, n.e.c.	(D)
3565	Industrial patterns	5.5	3623	Welding apparatus, electric	48.6
3599	Machinery, except electrical, n.e.c.	31.3			
3647	Vehicular lighting equipment	(D)			
3678	Electronic connectors	(D)			
3711	Motor vehicles and car bodies	(D)			
3714	Motor vehicle parts and accessories	20.0			

Table 6a. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1982 and 1977

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 product code	Product	1982			1977		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
	MACHINE TOOLS, METAL CUTTING TYPES						
3541- —	Total	(NA)	(X)	4 154.7	(NA)	(X)	2 560.5
35411 —	Boring machines:						
35411 00	Boring machines, excluding machining centers:						
	As reported in the census of manufactures	31	(X)	198.7	39	(X)	93.5
	As reported in the Current Industrial Report MQ-35W, Metalworking Machinery	(NA)	(X)	193.8	(NA)	(X)	84.9
35411 10	All boring machines valued less than \$2,500 each	(NA)	(D)	(D)	(NA)	(³)	(³)
	Boring machines valued at \$2,500 each or more:						
	Horizontal boring, drilling, and milling machines:						
35411 11	Table type	(NA)	77	51.4	(NA)	81	23.3
35411 15	Floor type	(NA)			(NA)	88	15.4
35411 55	Precision boring machines, including horizontal and vertical boring machines	(NA)	564	109.7	(NA)	509	32.0
35411 72	Jig boring machines, horizontal and vertical	(NA)			(NA)	83	14.2
35411 92	All other boring machines, except boring lathes	(NA)			(NA)	—	—
35412 —	Drilling machines:						
35412 00	Drilling machines, excluding machining centers:						
	As reported in the census of manufactures	49	(X)	67.3	58	(X)	108.9
	As reported in the Current Industrial Report MQ-35W, Metalworking Machinery	(NA)	(X)	65.9	(NA)	(X)	107.2
35412 97	All drilling machines valued less than \$2,500 each	(NA)	15 491	12.0	(NA)	⁵ 36 971	⁵ 12.8
35412 22	Drilling machines valued at \$2,500 each or more:						
	Vertical upright drilling machines, including plain, upright, and heavy duty	(NA)	546	6.7	(NA)	⁶ 1 779	⁶ 9.8
35412 33	Radial drilling machines, including plain and universal	(NA)	163	5.3	(NA)	⁷ 68	⁷ 2.1
35412 82	Deep hole drilling machines	(NA)	110	10.4	(NA)	(⁸)	(⁸)
35412 52	Multiple spindle drilling machines:						
	Adjustable joint and fixed center types	(NA)	386	10.7	(NA)	(D)	(D)
35412 68	All other automatic multiple spindle drilling machines	(NA)	272	15.6	(NA)	⁹ 105	⁹ 6.4
35412 98	All other drilling machines, n.e.c.	(NA)	78	5.2	(NA)	⁸ 2 202	⁸ 11.2

See footnotes at end of table.

Table 6a. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1982 and 1977—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 product code	Product	1982			1977		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
	MACHINE TOOLS, METAL CUTTING TYPES—Con.						
35413 —	Gear cutting machines:						
35413 00	Gear cutting machines:						
	As reported in the census of manufactures	11	(X)	87.3	17	(X)	67.1
	As reported in the Current Industrial Report MQ-35W,						
	Metalworking Machinery	(NA)	(X)	86.5	(NA)	(X)	61.4
35413 12	Gear hobbors, horizontal and vertical	(NA)			(NA)		
35413 31	Gear shapers, external spur and helical	(NA)	285	46.7	(NA)	240	18.6
35413 71	Gear tooth finishing machines	(NA)			(NA)		
35413 54	Bevel gear generators	(NA)	160	39.9	(NA)	384	42.8
35413 99	All other gear cutting machines	(NA)	—	—	(NA)	—	—
35414 —	Grinding, polishing, buffing, honing, and lapping machines,						
	except gear-tooth grinding, lapping, polishing, and buffing						
35414 00	machines:						
	Grinding, polishing, buffing, honing, and lapping machines,						
	except gear-tooth grinding, lapping, polishing, and buffing						
	machines:						
	As reported in the census of manufactures	90	(X)	515.3	94	(X)	288.3
	As reported in the Current Industrial Report MQ-35W,						
	Metalworking Machinery	(NA)	(X)	486.7	(NA)	(X)	¹⁰ 273.1
35414 10	All grinding, polishing, buffing, honing, and lapping						
	machines valued less than \$2,500 each	(NA)	48 651	13.2	(NA)	⁵ 80 484	⁵ 12.3
	All grinding, polishing, buffing, honing, and lapping						
	machines valued at \$2,500 each or more:						
	External cylindrical grinding machines:						
35414 11	Plain, including angular wheel types	(NA)	394	68.9	(NA)	172	19.0
35414 13	Universal	(NA)	302	23.7	(NA)	204	9.7
35414 15	Roll grinders	(NA)	(¹¹)	(¹¹)	(NA)	(D)	(D)
35414 16	Centerless grinders, including shoe type	(NA)	(¹¹)	(¹¹)	(NA)	(D)	(D)
35414 17	Chucking grinders	(NA)	(¹¹)	(¹¹)	(NA)	(D)	(D)
35414 19	All other external cylindrical grinding machines	(NA)	¹¹ 637	¹¹ 93.6	(NA)		
35414 23	Internal cylindrical grinding machines, including						
	centerless plain and chucking type	(NA)	(D)	(D)	(NA)	781	50.6
	Surface grinding machines:						
35414 33	Rotary table type, horizontal and vertical	(NA)	152	21.4	(NA)	271	14.5
	Reciprocating table type, including face grinders:						
35414 34	Horizontal and vertical	(NA)	1 270	35.4	(NA)	¹² 1 632	¹² 21.1
35414 37	Hand surface type	(NA)	1 310	11.2	(NA)	2 581	11.6
35414 39	All other surface grinding machines, including						
	planer type	(NA)	(D)	(D)	(NA)	(D)	(D)
35414 44	Disc grinders, double spindle	(NA)	(D)	(D)	(NA)		
35414 46	All other disc grinders, bench, floor, snag grinders,						
	and abrasive belt grinders	(NA)	469	3.5	(NA)	1 066	12.6
35414 52	Tool and cutter grinding machines (including						
	universal and special)	(NA)	1 568	31.1	(NA)	2 079	19.0
35414 92	All other grinding machines, n.e.c., including thread						
	grinding machines	(NA)	1 080	42.2	(NA)	1 266	15.0
	Honing and lapping machines, excluding gear honing						
	and lapping:						
35414 75	Internal, including combination bore-hone and						
	external	(NA)	1 002	23.0	(NA)	2 445	21.9
35414 79	Flat surface lapping machines, except gear						
	lapping	(NA)	165	4.3	(NA)		
35414 83	All other honing and lapping machines	(NA)	(D)	(D)	(NA)		
	Polishing and buffing machines:						
35414 65	Polishing stands, abrasive belt drum and disc	(NA)	(D)	(D)	(NA)	372	7.5
35414 69	All other polishing and buffing machines, including						
	speed lathes and multistation type	(NA)	650	24.4	(NA)	1 102	19.0
35415 —	Lathes:						
35415 00	Lathes (turning machines):						
	As reported in the census of manufactures	45	(X)	523.6	57	(X)	455.9
	As reported in the Current Industrial Report MQ-35W,						
	Metalworking Machinery	(NA)	(X)	507.3	(NA)	(X)	¹³ 436.3
35415 09	All lathes (turning machines) valued less than						
	\$2,500 each ⁵	(NA)	247	.5	(NA)	(D)	(D)
	All lathes (turning machines) valued at \$2,500 each or						
	more:						
	Numerically controlled (NC) turning machines:						
	Horizontal spindle NC turning machines:						
35415 11	Small	(NA)	775	87.9	(NA)	(¹⁴)	(¹⁴)
35415 12	Medium	(NA)	308	74.8	(NA)	(¹⁴)	(¹⁴)
35415 13	Large	(NA)	212	75.8	(NA)	(¹⁴)	(¹⁴)
	Vertical spindle NC turning machines:						
35415 21	Vertical turret lathes and vertical boring						
	machines more than 30 in. diameter table	(NA)			(NA)	(¹⁴)	(¹⁴)
35415 24	Vertical spindle turning machines (except VTL's						
	and VBM's more than 30 in. diameter table)	(NA)	194	94.8	(NA)	(¹⁴)	(¹⁴)
35415 26	All other vertical spindle turning						
	machines (NC)	(NA)			(NA)	(¹⁴)	(¹⁴)
	Nonnumerically controlled turning machines:						
	Horizontal spindle turning machines:						
	Engine or toolroom lathes:						
	Swing over cross slide not swing over bed:						
35415 14	Up to and including 8 in.	(NA)	1 095	12.5	(NA)	4 510	53.4
35415 22	More than 8 in. to 16 in.	(NA)	279	8.0	(NA)	(D)	(D)
35415 23	More than 16 in. to 23 in.	(NA)	(¹⁵)	(¹⁵)	(NA)		
35415 25	More than 23 in. to 36 in.	(NA)	(¹⁵)	(¹⁵)	(NA)		
35415 29	More than 36 in.	(NA)	(¹⁵)	(¹⁵)	(NA)	(D)	(D)
35415 37	All other engine or toolroom lathes	(NA)	¹⁵ 157	¹⁵ 20.5	(NA)	1 804	18.7
35415 54	Turret lathes, horizontal type	(NA)	(D)	(D)	(NA)	(D)	(D)

See footnotes at end of table.

Table 6a. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1982 and 1977—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 product code	Product	1982			1977		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
	MACHINE TOOLS, METAL CUTTING TYPES—Con.						
35415 -- 35415 00	Lathes—Con. Lathes (turning machines)—Con. As reported in the Current Industrial Report MQ-35W, Metalworking Machinery —Con. All lathes (turning machines) valued at \$2,500 each or more—Con. Nonnumerically controlled turning machines—Con. Horizontal spindle turning machines—Con. Automatic lathes: Single spindle: Bar (screw) machines ----- number..	(NA)	(D)	(D)	(NA)	(D)	(D)
35415 81	Chucking machines: Less than 20 in. capacity ----- do..	(NA)	142	8.4	(NA)	16790	1672.2
35415 63	20 in. capacity or more ----- do..	(NA)					
35415 88	Multiple spindle: Bar (screw) machines ----- do..	(NA)	293	40.7	(NA)	696	61.4
35415 67	Chucking machines ----- do..	(NA)	54	14.1	(NA)	214	37.9
35415 72	Automatic between center lathes ----- do..	(NA)	62	15.7	(NA)	141	23.0
35415 56	All other horizontal turning machines ----- do..	(NA)			(NA)	(17)	(17)
35415 85	Vertical spindle turning machines: Vertical turret lathes and vertical boring machines (VTL and VBM) ----- do..	(NA)	(D)	(D)	(NA)	121	38.5
35415 86	Vertical spindle turning machines (excluding VTL and VBM): Single spindle: Less than 30 in. diameter table ----- do..	(NA)	(D)	(D)	(NA)	(17)	(17)
35415 87	30 in. diameter table or more ----- do..	(NA)	-	-	(NA)	(17)	(17)
35415 89	Multiple spindle: Less than 30 in. diameter table ----- do..	(NA)	(D)	(D)	(NA)	(17)	(17)
35415 90	30 in. diameter table or more ----- do..	(NA)	-	-	(NA)	(17)	(17)
35415 98	All other vertical turning machines ----- do..	(NA)	(D)	(D)	(NA)	17712	1729.9
35416 -- 35416 00	Milling machines: Milling machines, excluding machining centers: As reported in the census of manufactures ----- As reported in the Current Industrial Report MQ-35W, Metalworking Machinery -----	34	(X)	264.5	40	(X)	167.8
35416 09	All milling machines valued less than \$2,500 each ⁵ ----- number.. All milling machines valued at \$2,500 or more:	(NA)	(X)	265.6	(NA)	(X)	160.2
35416 22	General purpose, knee or bed: Horizontal plain, universal and ram ----- do..	(NA)	5 850	64.4	(NA)	10 365	93.9
35416 25	Vertical, except ram ----- do..	(NA)					
35416 27	Vertical ram ----- do..	(NA)					
35416 29	All other general purpose type milling machines ----- do..	(NA)					
35416 31	Automatic and manufacturing: Single spindle ----- do..	(NA)	228	21.9	(NA)	586	9.2
35416 35	Multiple spindle and special purpose machines ----- do..	(NA)	429	22.9	(NA)	(D)	(D)
35416 53	Profile machines and duplicators ----- do..	(NA)	309	155.7	(NA)	18208	1818.5
35416 63	Die sinking and engraving machines, drum type millers, pantograph millers, and cam millers ----- do..	(NA)			(NA)	(D)	(D)
35416 97	All other milling machines, n.e.c ----- do..	(NA)			(NA)	183	30.6
3541A -- 3541A 00	Machining centers: Machining centers (multifunction numerically controlled machines): As reported in the census of manufactures ----- As reported in the Current Industrial Report MQ-35W, Metalworking Machinery -----	22	(X)	365.7	(NA)	(X)	(19)
3541A 01	Drill, mill, bore—manual tool change: Vertical ----- number..	(NA)	249	33.2	(NA)	20311	2027.3
3541A 03	Horizontal ----- do..	(NA)					
3541A 05	Drill, mill, bore—vertical (automatic tool change): Y-axis travel less than 20 in. ----- do..	(NA)	(D)	(D)	(NA)	482	54.4
3541A 07	Y-axis travel 20 in. through 26 in. ----- do..	(NA)	309	48.1			
3541A 09	Y-axis travel more than 26 in. ----- do..	(NA)	193	39.8			
3541A 11	Drill, mill, bore—horizontal (automatic tool change): Y-axis travel less than 27 in. ----- do..	(NA)	237	72.3	(NA)	408	93.4
3541A 13	Y-axis travel 27 in. through 40 in. ----- do..	(NA)	166	66.4			
3541A 15	Y-axis travel more than 40 in. ----- do..	(NA)	107	79.7			
3541A 17	Machining center with automatic multiple spindle head changing capability ----- do..	(NA)	-	-	(NA)	(21)	(21)
3541A 19	All other machining centers ----- do..	(NA)	(D)	(D)	(NA)	(21)	(21)
3541B -- 3541B 00	Station type machines: Station type machines: As reported in the census of manufactures ----- As reported in the Current Industrial Report MQ-35W, Metalworking Machinery -----	34	(X)	735.4	(NA)	(X)	(19)
3541B 31	Dial or rotary, trunnion and center column ----- number..	(NA)	(X)	731.1	(NA)	(X)	318.9
3541B 33	Way type ----- do..	(NA)	270	48.0	(NA)	885	318.9
3541B 35	Transfer ----- do..	(NA)	54	57.8			
3541B 37	Other station type, n.e.c ----- do..	(NA)	346	540.4			
3541C -- 3541C 00	Other metal cutting machine tools: Other metal cutting machine tools (except those designed primarily for home workshops): As reported in the census of manufactures ----- As reported in the Current Industrial Report MQ-35W, Metalworking Machinery -----	94	(X)	250.6	94	(X)	19647.3
3541C 41	Other metal cutting machine tools, n.e.c., valued less than \$2,500 ----- number..	(NA)	(X)	246.2	(NA)	(X)	22174.1
		(NA)	29 990	14.8	(NA)	5412	520.7

See footnotes at end of table.

Table 6a. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1982 and 1977—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 product code	Product	1982			1977		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
	MACHINE TOOLS, METAL CUTTING TYPES—Con.						
3541C — 3541C 00	Other metal cutting machine tools—Con. Other metal cutting machine tools (except those designed primarily for home workshops)—Con. As reported in the Current Industrial Report MQ-35W, Metalworking Machinery —Con. Machines valued at \$2,500 each or more:						
3541C 51	Broaching machines, including internal, surface, and all other broaching machines ----- number..	(NA)	166	38.3	(NA)	166	20.5
3541C 53	Sawing and cut-off machines:						
	Power hack saws ----- do..	(NA)	562	3.4	(NA)	(D)	(D)
3541C 55	Circular cut-off saws (cold) ----- do..	(NA)	100	5.1	(NA)	879	9.9
3541C 57	Abrasive wheel saws ----- do..	(NA)	322	3.5	(NA)		
3541C 59	Band saws ----- do..	(NA)	4 066	49.6	(NA)	7 080	32.0
3541C 61	All other sawing and cut-off machines (including contour sawing and filing) ----- do..	(NA)	1 228	37.1	(NA)	²³ 342	²³ 12.0
3541C 63	Tapping machines ----- do..	(NA)	373	7.7	(NA)	328	3.8
3541C 65	Spark erosion, ultrasonic and electrolytic machines: Electrical discharge machine (EDM) (not traveling wire) ----- do..	(NA)			(NA)	1 043	19.0
3541C 67	Traveling wire EDM ----- do..	(NA)	1 113	35.8	(NA)	⁽²⁴⁾	⁽²⁴⁾
3541C 69	Electrochemical machines ----- do..	(NA)			(NA)	⁽²⁴⁾	⁽²⁴⁾
3541C 71	All other spark erosion, ultrasonic, and electrolytic machines ----- do..	(NA)			(NA)	⁽²⁴⁾	⁽²⁴⁾
3541C 91	Miscellaneous metal cutting machine tools (including rifling, centering, key-seating, pointing, chamfering, facing, shaving, grooving, counter-sinking, burring, reaming, screw and nut slotting machines, threading planers, and shapers) ----- do..	(NA)	1 234	51.0	(NA)	²⁴ 116.3	²⁴ 37.5
35418 —	Machine tools designed primarily for home workshops, laboratories, garages, etc. (metalworking and primarily metalworking only) -----	(NA)	(X)	85.7	(NA)	(X)	66.3
35418 11	Drilling machines ----- thousands..	6	(S)	9.6	6	(S)	3.4
35418 31	Grinding and polishing machines, including crankshaft regrinding and valve grinding machines ----- do..	17	(S)	26.5	10	173.9	16.2
35418 51	Lathes ----- do..	2	(S)	9.0	2	⁽²⁵⁾	⁽²⁵⁾
35418 71	Sawing and cut-off machines ----- do..	7	(S)		5	*7.3	13.8
35418 91	Other metalworking (or primarily metalworking) types, including automotive cylinder re boring machines ----- do..	19	(S)	40.3	21	(S)	²⁵ 28.2
35418 00	Machine tools designed primarily for home workshops, laboratories, garages, etc. (metalworking and primarily metalworking only), n.s.k. -----	(NA)	(X)	.3	(NA)	(X)	4.8
35419 —	Parts for metal cutting type machine tools, sold separately, and rebuilt metal cutting type machine tools -----	(NA)	(X)	891.9	(NA)	(X)	502.1
35419 11	Parts for metal cutting machine tools, sold separately -----	206	(X)	725.3	148	(X)	418.0
35419 41	Rebuilt metal cutting type machine tools -----	65	(X)	153.9	48	(X)	82.7
35419 00	Parts for metal cutting type machine tools, sold separately, and rebuilt metal cutting type machine tools, n.s.k. -----	(NA)	(X)	12.7	(NA)	(X)	1.4
35410 00	Machine tools, metal cutting, n.s.k., typically for establishments with 10 employees or more (see note) -----	(NA)	(X)	27.4	(NA)	(X)	90.0
35410 02	Machine tools, metal cutting, n.s.k., typically for establishments with less than 10 employees (see note) -----	(NA)	(X)	141.3	(NA)	(X)	73.3
	MACHINE TOOLS, METAL FORMING TYPES						
3542- —	Total -----	(NA)	(X)	1 383.9	(NA)	(X)	1 114.7
35421 — 35421 10	Punching, shearing, bending, and forming machines -----	(NA)	(X)	317.3	76	(X)	280.1
	Punching and shearing machines, including power and manual:						
	As reported in the census of manufactures -----	46	(X)	147.7	⁽²⁶⁾	(X)	⁽²⁶⁾
	As reported in the Current Industrial Report MQ-35W, Metalworking Machinery -----	(NA)	(X)	142.2	(NA)	(X)	⁽²⁷⁾
35421 08	All punching and shearing machines valued less than \$2,500 each ----- number..	(NA)	5 996	5.8	(NA)	⁵ 5674	⁵ 2.5
	All punching and shearing machines valued at \$2,500 each or more:						
	Power operated only:						
35421 11	Punches, including combination punching and shearing machines ----- do..	(NA)	1 870	21.4	(NA)	1 653	15.4
35421 16	Punching machines, fixed position and two axes positioning table ----- do..	(NA)	407	45.7	(NA)	767	54.2
	Plate shearing machines:						
35421 12	Mechanical ----- do..	(NA)	580	38.1	(NA)	1 254	44.3
35421 14	Hydraulic ----- do..	(NA)	362	17.1	(NA)		
35421 15	Bar, angle, and rotary shearing machines ----- do..	(NA)	152	1.8	(NA)	234	2.4
35421 19	Other power operated punching and shearing machines ----- do..	(NA)	365	12.3	(NA)	²⁸ 1 354	²⁸ 11.9

See footnotes at end of table.

Table 6a. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1982 and 1977—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 product code	Product	1982			1977		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
	MACHINE TOOLS, METAL FORMING TYPES— Con.						
35421 — 35421 20	Punching, shearing, bending, and forming machines —Con. Bending and forming machines, including power and manual:						
	As reported in the census of manufactures	67	(X)	169.3	²⁶ 76	(X)	²⁶ 280.1
	As reported in the Current Industrial Report MQ-35W, Metalworking Machinery	(NA)	(X)	166.5	(NA)	(X)	²⁷ 267.9
35421 33	All bending and forming machines, power operated, valued less than \$2,500 each	(NA)	14 016	10.0	(NA)	⁵¹ 858.4	⁵⁶ 3
	All bending and forming machines, power operated, valued at \$2,500 each or more:						
	Press brakes:						
35421 39	Mechanical	(NA)	415	7.7	(NA)	⁽²⁹⁾	⁽²⁹⁾
35421 40	Hydraulic	(NA)	612	28.0	(NA)	⁽²⁹⁾	⁽²⁹⁾
35421 41	Hydromechanical	(NA)	262	5.8	(NA)	⁽²⁹⁾	⁽²⁹⁾
35421 37	Bending rolls, sheet, and plate	(NA)	262	13.9	(NA)	450	9.4
35421 35	Bending rolls, angles, bars, shapes, and tubes	(NA)	116	13.3	(NA)	²⁹ 154.8	²⁹ 43.6
35421 43	Rotary bending and forming machines, including rotary head	(NA)	1 051	24.4	(NA)	3 523	26.5
35421 47	Ram and press bending machines	(NA)	819	11.4	(NA)		
35421 49	Other bending and forming machines, including folders	(NA)	2 453	52.1	(NA)	6 275	51.4
35421 00	Punching, shearing, bending, and forming machines, n.s.k.	(NA)	(X)	.3	(NA)	(X)	—
35422 — 35422 00	Presses, except forging: Metalworking presses, except forging:						
	As reported in the census of manufactures	76	(X)	369.2	69	(X)	³⁰ 282.6
	As reported in the Current Industrial Report MQ-35W, Metalworking Machinery	(NA)	(X)	344.8	(NA)	(X)	³¹ 260.7
35422 01	All presses valued less than \$2,500 each	(NA)	6 520	.6	(NA)	⁵⁶ 540	⁵² 8
	All presses valued at \$2,500 each or more:						
	Mechanical presses:						
	Open back inclinable-gap type:						
35422 12	50 tons and or less	(NA)	433	9.6	(NA)	3 373	16.2
35422 02	51 tons to 120 tons	(NA)	255	11.0	(NA)		
35422 03	121 tons or more	(NA)	(D)	(D)	(NA)	898	27.2
	Vertical, straight-sided, and arch frame:						
	Single-action:						
35422 16	Single-point	(NA)	(D)	(D)	(NA)	(D)	(D)
	Two-point:						
35422 17	300 tons or less	(NA)			(NA)	292	27.4
35422 18	301 tons or more	(NA)	137	43.1	(NA)	66	23.1
35422 42	Gap and horn type	(NA)	162	4.5	(NA)	386	7.1
35422 45	Automatic presses, strip or coil feed	(NA)	327	47.6	(NA)	³² 16.7	³² 9.9
35422 53	All other mechanical presses	(NA)	296	103.3	(NA)	133	22.1
	Hydraulic presses:						
	Vertical single-action, all tonnages:						
35422 56	Housing or straight-side type	(NA)	82	30.0	(NA)		
35422 57	Column type	(NA)	268	7.3	(NA)	518	13.5
	Gap or C-frame:						
35422 58	15 tons or less	(NA)	450	9.3	(NA)		
35422 59	16 tons to 35 tons	(NA)			(NA)	1 667	8.0
35422 60	More than 35 tons	(NA)	⁽³³⁾ 3399	⁽³³⁾ 334.8	(NA)		
35422 73	Vertical double-action 2-slide type, all tonnages	(NA)			(NA)	(D)	(D)
35422 77	Extrusion presses, all types	(NA)			(NA)	(D)	(D)
35422 92	Other hydraulic and pneumatic presses, including horizontal	(NA)	569	53.8	(NA)	1 611	17.3
35423 — 35423 00	Metal forming machine tools, n.e.c., including forging machines:						
	Other metal forming machine tools, including forging machines, thread-rolling machinery, die-casting machines, riveting machines (except hand-held portable types) can, barrel, and drum metal container making machines, etc.:						
	As reported in the census of manufactures	74	(X)	217.0	57	(X)	³⁰ 171.7
	As reported in the Current Industrial Report MQ-35W, Metalworking Machinery	(NA)	(X)	210.0	(NA)	(X)	³⁴ 159.4
	Forging machines:						
35423 27	Headers and upsetters	(NA)			(NA)	⁽³⁵⁾	⁽³⁵⁾
35423 31	Swaging machines	(NA)			(NA)	⁽³⁵⁾	⁽³⁵⁾
35423 32	Forging presses	(NA)	383	79.0	(NA)	⁽³⁰⁾	⁽³⁰⁾
35423 37	All other forging machines	(NA)			(NA)	³⁵ 49.4	³⁵ 55.1
	All other metal forming type machine tools:						
35423 97	All other metal forming type machine tools valued less than \$2,500 each	(NA)	1 493	2.4	(NA)	⁵⁹ 98	⁵ 4
	All other metal forming type machine tools valued at \$2,500 each or more:						
35423 43	Thread-rolling machinery	(NA)	111	7.2	(NA)	203	7.1
35423 30	Metal container making machinery	(NA)	1 349	44.0	(NA)	⁽³⁶⁾	⁽³⁶⁾
	Die casting machines:						
35423 51	200 tons or less	(NA)			(NA)		
35423 52	201 tons to 500 tons	(NA)	⁽³⁷⁾ 3775	⁽³⁷⁾ 378.0	(NA)		
35423 53	501 tons to 700 tons	(NA)			(NA)	(X)	³⁴ 25.8
35423 54	701 tons or more	(NA)	⁽³⁸⁾ 3831	⁽³⁸⁾ 388.7	(NA)		
35423 49	Riveting machines	(NA)	1 320	14.6	(NA)	2 969	14.6
35423 93	All other metal forming type machine tools, n.e.c.	(NA)	1 939	46.1	(NA)	³⁶ 216.0	³⁶ 52.3

See footnotes at end of table.

Table 6a. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1982 and 1977—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 product code	Product	1982			1977		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
	MACHINE TOOLS, METAL FORMING TYPES— Con.						
35424 —	Parts for metal forming machine tools and rebuilt metal forming machinery	(NA)	(X)	380.0	(NA)	(X)	295.5
35424 11	Parts for metal forming machine tools, except parts and attachments for electric and pneumatic power driven hand tools (sold separately)	141	(X)	318.0	104	(X)	273.7
35424 75	Rebuilt metal forming type machine tools	24	(X)	60.0	11	(X)	8.3
35424 00	Parts for metal forming machine tools and rebuilt metal forming machinery, n.s.k.	(NA)	(X)	2.0	(NA)	(X)	13.5
35420 00	Machine tools, metal forming types, n.s.k., typically for establishments with 10 employees or more (see note)	(NA)	(X)	56.9	(NA)	(X)	27.4
35420 02	Machine tools, metal forming types, n.s.k., typically for establishments with less than 10 employees (see note)	(NA)	(X)	43.6	(NA)	(X)	57.6
	SPECIAL DIES, TOOLS, JIGS, AND FIXTURES						
3544— —	Total	(NA)	(X)	6 099.3	(NA)	(X)	4 450.2
35441 —	Special dies and tools, die sets, jigs, and fixtures	(NA)	(X)	3 425.9	(NA)	(X)	2 578.0
	Jigs and fixtures, all types:						
35441 13	Gauging and checking types:						
	Less than 1,000 lb weight	234	(X)	157.4	215	(X)	149.6
35441 15	1,000 lb weight or more	53	(X)	48.3	57	(X)	47.9
	All other jigs and fixtures (holding, positioning, layout, assembly, etc.):						
35441 17	Less than 1,000 lb weight	440	(X)	258.6	298	(X)	214.2
35441 18	1,000 lb weight or more	141	(X)	330.9	129	(X)	142.5
35441 19	Standard catalog components and parts for jigs and fixtures, including drill bushings	35	(X)	57.7	42	(X)	44.4
	Dies, metal cutting only:						
35441 21	Press brake dies	32	(X)	23.9	38	(X)	32.0
	Forming and drawing dies:						
35441 22	500 lb weight or less	178	(X)	86.6	161	(X)	67.9
35441 24	501 to 3,000 lb weight	195	(X)	96.6	155	(X)	119.9
35441 26	More than 3,000 lb weight	111	(X)	212.7	94	(X)	208.9
	Stamping dies, including lamination and blanking dies:						
	Progressive type dies:						
35441 27	High speed steel	533	(X)	342.5	437	(X)	187.0
35441 28	Carbide	108	(X)	88.0	84	(X)	52.3
35441 29	All other stamping type dies (punch, trim, notch, pierce, perforate, etc.)	496	(X)	611.1	331	(X)	407.7
	Forging dies, including cold forging and heading:						
35441 33	Open die type	49	(X)	26.2	37	(X)	17.6
35441 35	Closed die type	80	(X)	79.2	76	(X)	44.5
	Extrusion and wiredrawing and straightening dies:						
35441 43	High speed steel	62	(X)	60.8	30	(X)	21.3
35441 45	Carbide	36	(X)	31.6	41	(X)	18.0
	All other dies:						
35441 46	High speed steel	67	(X)	42.3	212	(X)	140.8
35441 47	Carbide	43	(X)	40.1			
35441 48	Other	81	(X)	60.8			
	Standard and special components and parts for dies:						
35441 73	Die sets	43	(X)	78.2	56	(X)	56.1
	Standard punches:						
35441 75	Steel	60	(X)	68.6	113	(X)	112.8
35441 77	Carbide	29	(X)	11.5			
35441 78	Other	57	(X)	79.3			
35441 91	Other specially designed tooling, prototypes, and models	325	(X)	350.6	401	(X)	333.3
35441 00	Special dies and tools, die sets, jigs, and fixtures, n.s.k.	(NA)	(X)	182.3	(NA)	(X)	159.5
35442 —	Industrial molds	(NA)	(X)	1 800.6	(NA)	(X)	1 040.0
	Industrial molds made of metal:						
	For casting metals:						
35442 11	Diecasting dies (molds)	304	(X)	213.2	171	(X)	139.1
35442 13	Foundry molds, except ingot molds	49	(X)	40.6	47	(X)	35.8
	For molding wax:						
35442 21	Injection molds for wax pattern production for investment casting	75	(X)	53.5	(³⁹)	(X)	(³⁹)
35442 25	All other molds for wax	6	(X)	2.7	(³⁹)	(X)	(³⁹)
35442 33	For molding rubber products, including tire molds	118	(X)	104.8	64	(X)	73.0
	For molding plastics:						
35442 51	Injection molds	1 084	(X)	1 008.0	507	(X)	442.2
35442 55	Compression molds, including matched metal molds	118	(X)	79.3	86	(X)	34.7
35442 59	All other molds, including transfer, plunger, and rotational molds	119	(X)	68.5	63	(X)	33.5
35442 62	All other molds made of metal (including molds for glass and other materials) and mold bases	65	(X)	143.2	3947	(X)	39104.0
35442 63	Industrial molds made of materials other than metal	40	(X)	39.5	16	(X)	14.6
35442 00	Industrial molds, n.s.k.	(NA)	(X)	47.3	(NA)	(X)	163.1
35440 00	Special dies, tools, jigs, and fixtures, n.s.k., typically for establishments with 10 employees or more (see note)	(NA)	(X)	501.7	(NA)	(X)	574.2
35440 02	Special dies, tools, jigs, and fixtures, n.s.k., typically for establishments with less than 10 employees (see note)	(NA)	(X)	371.1	(NA)	(X)	258.0

See footnotes at end of table.

Table 6a. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1982 and 1977—Con.

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1982 product code	Product	1982			1977		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
	MACHINE TOOL ACCESSORIES						
3545--	Total -----	(NA)	(X)	3 069.1	(NA)	(X)	2 238.9
35451 --	Small cutting tools for machine tools and metalworking machinery -----	(NA)	(X)	1 755.7	(NA)	(X)	1 376.4
35451 14	Broaches (excluding holders and burnishing bars) -----	39	(X)	85.9	24	(X)	46.5
	Twist drills (excluding combined drills, countersinks, and gun drills):						
	Carbon steel and high speed steel:						
35451 16	1/2 in. or less diameter, taper shank -----	14	(X)	30.7	12	(X)	16.2
35451 17	1/2 in. or less diameter, straight shank -----	24	(X)	133.6	20	(X)	123.0
35451 18	More than 1/2 in. diameter, taper shank -----	12	(X)	12.6	14	(X)	17.0
35451 19	More than 1/2 in. diameter, straight shank -----	17	(X)	31.3	16	(X)	29.8
35451 24	Carbide, solid and tipped (excludes tips and blanks sold separately and masonry drills) -----	25	(X)	35.5	25	(X)	24.6
35451 22	Masonry drill bits -----	12	(X)	27.6	10	(X)	6.6
35451 25	Gun drills and gun reamers -----	18	(X)	22.9	11	(X)	13.7
35451 26	Combination drills and countersinks -----	12	(X)	13.2	8	(X)	8.3
35451 27	Countersinks, including port cutters, etc., (excluding combined drills and countersinks and pilots for interchangeable pilot types) -----	18	(X)	7.8	13	(X)	6.2
35451 29	Counterbores, including spot facers, etc. (excluding pilots for interchangeable pilot types) -----	31	(X)	12.6	24	(X)	17.5
35451 32	Reamers (all types, but excluding gun reamers):						
	Carbon steel and high speed steel, including blades sold separately -----	31	(X)	28.5	30	(X)	23.0
35451 36	Carbide, solid and tipped (excluding tips and blanks sold separately), including replaceable blades sold separately -----	33	(X)	15.5	26	(X)	14.1
35451 42	Hobs, all types -----	8	(X)	32.0	7	(X)	24.9
35451 47	Gear shaper cutters and gear shaving cutters -----	9	(X)	35.6	9	(X)	24.0
	End mills and milling cutters:						
	End mills, solid and tipped, die-sinking, contour, router, tracer, hollow mills, etc. (excluding all inserted blade types and shell mills):						
35451 51	High speed steel -----	37	(X)	92.2	27	(X)	64.0
35451 52	Carbide, solid and tipped (excluding blades sold separately) -----	40	(X)	32.1	21	(X)	13.8
	Inserted blade type cutters, all types, complete:						
	Nonindexable:						
35451 43	High speed steel -----	5	(X)	2.1	7	(X)	4.7
35451 44	Carbide -----	7	(X)	5.3	9	(X)	10.9
	Indexable or throwaway insert type:						
35451 48	High speed steel -----	1	(X)	15.6	5	(X)	4.0
35451 49	Carbide -----	13	(X)	15.6	12	(X)	14.3
35451 58	Form relieved cutters, including high speed steel and carbide (solid and tipped) -----	20	(X)	16.4	19	(X)	14.6
35451 59	Slitting saws and screw slotting cutters, including high speed steel and carbide (solid and tipped) -----	12	(X)	10.9	14	(X)	9.3
35451 61	Milling cutters, n.e.c.: -----						
	High speed steel -----	19	(X)	49.0	26	(X)	46.5
35451 63	Carbide, solid and tipped (excluding tips and blanks sold separately) -----	13	(X)	5.7	15	(X)	4.6
	Single and double point tools ⁴⁰ :						
35451 65	High speed steel -----	27	(X)	12.7	20	(X)	9.4
35451 66	Carbide, solid and tipped (excluding rough blanks, and tips and blanks sold separately) -----	45	(X)	44.1	37	(X)	46.6
35451 68	Other materials -----	12	(X)	11.1	4	(X)	5.6
35451 72	Circular form tools, including semifinished blanks -----	16	(X)	29.7	13	(X)	12.9
	Threading tools:						
	Taps (excluding taps in threading sets and screw plates and inserted chaser types):						
35451 77	Carbon steel and carbide -----	9	(X)	7.1	9	(X)	5.6
	High speed steel:						
35451 70	Cut thread -----	10	(X)	22.9	10	(X)	8.3
35451 71	Ground thread -----	23	(X)	92.5	22	(X)	97.6
35451 73	Dies, with two or more thread-forming edges integral with the body, including round, square, hexagonal, spring, two-piece, and adjustable types (excluding inserted chaser types and dies sold in threading sets or screw plates) -----	8	(X)	23.1	10	(X)	17.4
35451 75	Chasers, single edge thread cutting, circular blade, and tangent types for mounting into or onto holders, die heads, and tap bodies (excluding holders for all die heads, tap bodies, and chasers) -----	9	(X)	23.1	7	(X)	21.6
35451 87	Thread rolling dies, including circular, flat, and planetary -----	13	(X)	29.8	8	(X)	21.3
35451 89	Other threading tools, including screw plates and threading sets -----	11	(X)	14.0	7	(X)	6.3
	Blanks, tips, and inserts ⁴¹ :						
	Molded blanks and tips (excluding pressed-to-size inserts):						
35451 91	Carbide -----	28	(X)	74.0	23	(X)	71.0
35451 93	Other than carbide -----	8	(X)	10.5			
	Inserts, indexable and throwaway types:						
	Carbide:						
35451 82	Utility ground -----	14	(X)	85.1	15	(X)	45.9
35451 83	Precision ground -----	42	(X)	149.7	31	(X)	130.5
35451 84	Pressed to size, including inserts with center holes and with molded chip breakers -----	13	(X)	84.5	11	(X)	52.9
35451 95	Ceramic -----	5	(X)	2.9			
35451 96	Other than carbide and ceramic -----	7	(X)	2.6	3	(X)	4.5

See footnotes at end of table.

Table 6a. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1982 and 1977—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 product code	Product	1982			1977		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
	MACHINE TOOL ACCESSORIES—Con.						
35451 —	Small cutting tools for machine tools and metalworking machinery—Con.						
	Blanks, tips, and inserts ⁴¹ —Con.						
	Inserts, other than indexable and throwaway types:						
35451 86	Carbide	15	(X)	22.3	15	(X)	38.4
35451 97	Ceramic	2	(X)	(⁴²)	(NA)		
35451 99	Other than carbide and ceramic	6	(X)	427.2	(NA)		
	Other types of cutting tools for machine tools, n.e.c., including rotary burrs, rotary files, and spade drills:						
35451 92	Carbon steel	32	(X)	47.6	15	(X)	17.1
35451 94	High speed steel	50	(X)	53.2	36	(X)	35.3
35451 98	Carbide, solid and tipped (excluding tips and blanks sold separately)	62	(X)	52.1	36	(X)	42.4
35451 00	Small cutting tools for machine tools and metalworking machinery, n.s.k.	(NA)	(X)	99.1	(NA)	(X)	103.8
35453 —	Attachments and accessories for machine tools and metalworking machinery, n.e.c.	(NA)	(X)	593.6	(NA)	(X)	430.9
35453 12	Tool holders:						
	Turning tool holders, mechanically clamping for inserts and bits (except box tools and screw machine tool holders)	34	(X)	93.1	28	(X)	47.9
35453 14	Boring bars and heads	29	(X)	49.8	17	(X)	29.7
35453 17	Drilling, reaming, and tapping chucks	9	(X)	18.8	6	(X)	22.9
35453 31	Special tooling and attachments for screw and automatic machines (box tools, tool holders, turrets, rollers, etc.) except standard cutting bits and tools	19	(X)	19.3	13	(X)	13.1
35453 37	Dieheads and tap bodies for chaser type threading and thread-rolling heads (excludes hand type die stocks)	5	(X)	5.1	4	(X)	4.7
35453 38	Other tool holders, including other chucks, drill heads, tool posts, turrets, sleeves, sockets, etc.	38	(X)	74.4	27	(X)	40.0
35453 45	Work holding devices:						
	Rotary tables and indexing work holders, including numerically controlled	17	(X)	34.7	17	(X)	22.0
35453 59	Other work holding and positioning devices, including vises, mandrels, feeding fingers and collets, clamps, stops, face plates, spacers, etc.	80	(X)	129.0	62	(X)	100.6
	Other attachments and accessories for machine tools and metalworking machinery, n.e.c.:						
35453 41	Tracer and tapering attachments, safety devices, centers, dogs, work rests, chutes, etc. (excluding cutting tools, tool end work holders, jigs, fixtures, dies, and molds)	15	(X)	9.1	10	(X)	10.3
35453 43	Lathe chucks	7	(X)	24.2	4	(X)	(⁴³)
35453 51	Toolroom specialties, including levels, angle plates, parallels, sine bars, V-blocks, flats, etc.	4	(X)	115.5	4	(X)	1.2
35453 98	Other attachments and accessories	66	(X)		52	(X)	43101.0
35453 00	Attachments and accessories for machine tools and metalworking machinery, n.e.c., n.s.k.	(NA)	(X)	20.7	(NA)	(X)	37.5
35452 —	Precision measuring tools	(NA)	(X)	402.7	(NA)	(X)	208.2
	Inspection, quality control, toolroom, and machinists' precision tools:						
35452 11	Comparators (excluding optical)	11	(X)	26.7	8	(X)	13.4
	Fixed size limit gauges (American Gauge Design type C58-61):						
35452 13	Fixture type	27	(X)	18.5	11	(X)	9.1
35452 15	Thread type	20	(X)	30.9	14	(X)	8.9
35452 17	Adjustable size limit gauges	14	(X)	15.9	6	(X)	7.1
35452 21	Gauge blocks	5	(X)	6.6	4	(X)	2.3
35452 61	Dial indicators	7	(X)	23.1	6	(X)	18.6
35452 65	Micrometers and calipers	7	(X)	24.8	7	(X)	17.5
35452 71	Pneumatic and electronic gauges (manual and automatic)	23	(X)	94.9	6	(X)	14.8
35452 92	Gear-checking instruments and machines	10	(X)	11.9	444	(X)	443.8
	Coordinate and contour measuring machines (inspection and gauging):						
35452 94	Conventional	8	(X)	55.2	6	(X)	28.0
35452 95	Numerically controlled	5	(X)				
35452 99	Other machinists' precision tools, including dividers and surface texture measuring machines	30	(X)	76.3	24	(X)	58.3
35452 00	Precision measuring tools, n.s.k.	(NA)	(X)	17.9	(NA)	(X)	26.5
35450 00	Machine tool accessories, n.s.k., typically for establishments with 10 employees or more (see note)	(NA)	(X)	217.7	(NA)	(X)	161.6
35450 02	Machine tool accessories, n.s.k., typically for establishments with less than 10 employees (see note)	(NA)	(X)	99.3	(NA)	(X)	61.9
	POWER DRIVEN HAND TOOLS						
3546— —	Total	(NA)	(X)	1 594.8	(NA)	(X)	1 496.5
35461 —	Power driven hand tools, electric, including battery powered	(NA)	(X)	829.9	(NA)	(X)	748.7
	Electric portable power driven hand tools which are controlled by hand; the positioning in operation need not be fixed, high cycle:						
	Drills:						
35461 01	Armature mounted primarily on sleeve bearings:						
	1/4 in. chuck size or less	3			5	1 263.1	16.4
35461 03	5/16 in. to less than 1/2 in.	5			4	2 694.3	41.6
35461 04	1/2 in. or more	4			5	389.7	8.5

See footnotes at end of table.

Table 6a. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1982 and 1977—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 product code	Product	1982			1977		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
	POWER DRIVEN HAND TOOLS—Con.						
35461 —	Power driven hand tools, electric, including battery powered —Con. Electric portable power driven hand tools which are controlled by hand; the positioning in operation need not be fixed, high cycle—Con. Drills—Con. Armature mounted primarily on other than sleeve bearings:						
35461 05	1/4 in. chuck size or less thousands..	5	95.2	7.0	7	126.8	7.8
35461 07	5/16 in. to less than 1/2 in. do..	7	979.1	44.3	8	1 252.9	36.7
35461 09	1/2 in. or more do..	7	339.1	34.8	10	*506.5	35.1
35461 12	Saws, circular: Armature mounted primarily on sleeve bearings do.. Armature mounted primarily on other than sleeve bearings:	4	(D)	(⁴⁵)	6	*1 673.0	36.8
35461 15	7 in. blade or less do..	4	26.9	2.5	6	411.4	13.1
35461 16	More than 7 in. to less than 8 in. blade do..	6	634.3	37.1	8	1 391.3	49.8
35461 17	8 in. blade or more do..	4	28.7	3.7	4	**136.9	7.7
35461 18	Saws, jig, saber, reciprocating: Armature mounted on ball bearings do..	7	1 916.6	49.1	7	451.5	20.2
35461 19	Armature mounted on other than ball bearings do..	4			5	3 166.8	40.0
35461 37	Chain saws do..	4	(D)	(⁴⁵)	5	*366.1	12.3
35461 22	Screwdrivers and nut-runners do..	5	147.9	13.0	4	101.0	7.5
35461 21	Hammers, percussion and rotary, without drill chuck do..	5	24.6	7.8	5	305.7	14.4
35461 23	Hammers—drills, with a drill chuck do..	7	83.0	12.8	4	177.4	8.3
35461 25	Impact wrenches do..	8	91.3	10.5	5	148.7	10.0
35461 28	Shears and nibblers do..	6	**38.0	5.8	4	26.0	3.7
35461 31	Planers do..	4	871.4	36.6	10	1 342.5	43.0
35461 32	Routers do..	7					
35461 26	Circular polishers, sanders, and grinders (except bench grinders): Right-angle circular polishers, sanders, and grinders do..	10	848.7	54.2	9	*808.4	41.6
35461 29	All other circular polishers, sanders, and grinders (including die grinders, but excluding bench) do..	10	117.2	9.1	8	459.1	17.4
35461 33	Sanders (except circular): Belt do..	8	619.8	30.7	8	620.9	25.3
35461 34	Oscillating, reciprocating, and vibrating do..	7	568.0	14.4	9	1 832.9	30.3
35461 35	Other electric-powered hand tools do..	18	(S)	⁴⁵ 166.6	14	*1 186.2	39.4
35461 36	Parts, attachments, and accessories for electric-powered hand tools (sold separately), excluding saw blades, drill bits, screwdrivers, etc. do..	20	(X)	209.2	22	(X)	172.7
35461 00	Power driven hand tools, electric, including battery powered, n.s.k. do..	(NA)	(X)	9.9	(NA)	(X)	9.3
35462 —	Power driven hand tools, pneumatic, hydraulic, and powder-actuated do..	(NA)	(X)	382.4	(NA)	(X)	371.1
35462 38	Pneumatic: Drills, screwdrivers, and nut-runners thousands..	15	223.5	51.8	13	284.5	46.9
35462 37	Percussion tools (such as runners, riveters, chippers, scalars) do..	15	(S)	22.7	17	(S)	46.1
35462 41	Impact wrenches do..	11	253.4	45.7	9	293.4	37.5
35462 43	Grinders, polishers, sanders do..	14	438.2	41.2	14	395.7	36.3
35462 45	Chain saws do..	1	(S)	66.8	17	(S)	78.3
35462 49	Other pneumatic-powered hand tools do..	34					
35462 51	Parts, attachments, and accessories for pneumatic- powered hand tools (sold separately), excluding drill bits, screwdrivers, etc. do..	24	(X)	110.3	20	(X)	61.9
35462 61	Powder-actuated hand tools thousands..	3	(S)	30.3	(NA)	(S)	5.6
35462 71	Hydraulic: Chain saws, including pole do..	2					
35462 73	Circular saws, including pole do..	2	(S)	30.3	(NA)	(S)	5.6
35462 74	Impact wrenches do..	1					
35462 75	Compression tools do..	1	(S)	30.3	(NA)	(S)	5.6
35462 76	Hook pruners (tree pruners) do..	1					
35462 77	Drills do..	1	(S)	30.3	(NA)	(S)	5.6
35462 78	Other hydraulic-powered hand tools do..	8					
35462 79	Parts, attachments, and accessories for powder-actuated and hydraulic hand tools (sold separately) (excluding saw blades, drill bits, etc.) do..	6	(X)	8.3	11	(X)	53.2
35462 00	Power driven hand tools, pneumatic, hydraulic, and powder-actuated, n.s.k. do..	(NA)	(X)	5.3	(NA)	(X)	5.4
35463 —	Power driven hand tools, engine (internal combustion) driven do..	(NA)	(X)	326.5	(NA)	(X)	347.1
35463 01	Chain saws thousands..	6	3 123.8	211.5	7	(X)	347.1
35463 11	Other, including cut-off saws and drills do..	4	(S)	12.6	3		
35463 19	Parts, attachments, and accessories for engine-driven hand tools (excluding saw blades, drill bits, engines, and engine parts, etc.) do..	10	(X)	99.3	5	(X)	—
35463 00	Power driven hand tools, engine (internal combustion) driven, n.s.k. do..	(NA)	(X)	3.2	(NA)		
35460 00	Power driven hand tools, n.s.k., typically for establishments with 10 employees or more (see note) do..	(NA)	(X)	25.0	(NA)	(X)	22.4
35460 02	Power driven hand tools, n.s.k., typically for establishments with less than 10 employees (see note) do..	(NA)	(X)	31.0	(NA)	(X)	7.2

See footnotes at end of table.

Table 6a. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1982 and 1977—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 product code	Product	1982			1977		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
	ROLLING MILL MACHINERY						
3547- --	Total -----	(NA)	(X)	445.1	(NA)	(X)	361.0
35471 --	Hot rolling mill machinery, except tube rolling -----	(NA)	(X)	180.5	(NA)	(X)	147.0
35471 11	Blooming and slabbing mill machinery -----	5	(X)	(46)	4	(X)	18.5
35471 13	Plate rolling mill machinery, except tin plate machinery -----	3	(X)	4.8	4	(X)	38.6
35471 17	Hot strip mill machinery -----	3	(X)	466.4	4	(X)	35.9
35471 18	Other hot rolling mill machinery and equipment -----	10	(X)	94.6	10	(X)	53.5
35471 00	Hot rolling mill machinery, except tube rolling, n.s.k. -----	(NA)	(X)	14.7	(NA)	(X)	.5
35472 --	Cold rolling mill machinery -----	(NA)	(X)	65.1	(NA)	(X)	74.9
35472 21	Tandem roll mills -----	5	(X)	5.9	3	(X)	20.0
35472 23	Single stand roll mills -----	5	(X)	15.6	4	(X)	5.8
35472 27	Double stand roll mills -----	3	(X)	41.2	11	(X)	44.7
35472 28	Other cold rolling mill machinery and equipment -----	8	(X)	2.3	(NA)	(X)	4.4
35472 00	Cold rolling mill machinery, n.s.k. -----	(NA)	(X)		(NA)	(X)	
35473 --	Rolling mill machinery, n.e.c., including tube mill machinery -----	(NA)	(X)	188.2	(NA)	(X)	120.8
35473 35	Tube mill machinery -----	14	(Z)	95.7	13	(X)	45.0
35473 47	Processing lines, including pickling and cleaning, tinning, galvanizing, etc. -----	1	(X)	91.3	5	(X)	14.7
35473 56	Other rolling mill machinery and equipment -----	16	(X)		13	(X)	56.0
35473 00	Rolling mill machinery, n.e.c., including tube mill machinery, n.s.k. -----	(NA)	(X)	1.2	(NA)	(X)	5.1
35470 00	Rolling mill machinery, n.s.k., typically for establishments with 10 employees or more (see note) -----	(NA)	(X)	2.3	(NA)	(X)	9.0
35470 02	Rolling mill machinery, n.s.k., typically for establishments with less than 10 employees (see note) -----	(NA)	(X)	9.1	(NA)	(X)	9.3
	METALWORKING MACHINERY, N.E.C.						
3549- --	Total -----	(NA)	(X)	1 376.9	(NA)	(X)	908.9
35492 --	Assembly machines -----	(NA)	(X)	367.6	(NA)	(X)	128.4
35492 11	Rotary transfer (dial or rotary, trunnion, center column) ----- number	23	(S)	29.2	16	(S)	31.9
35492 15	In-line transfer, synchronous ----- do	19	(S)	53.9	11	76	23.1
35492 17	In-line transfer, nonsynchronous ----- do	13	**119	1197	8	*6.7	25.7
35492 19	Special purpose and other types ----- do	48	(S)	140.8	30	(X)	42.3
35492 00	Assembly machines, n.s.k. -----	(NA)	(X)	24.0	(NA)	(X)	5.4
35494 --	Automotive maintenance equipment, except hand tools -----	(NA)	(X)	200.3	47	(X)	188.0
35494 01	Frame correction equipment -----	7	(X)	19.2	47	(X)	188.0
35494 03	Wheel alignment equipment -----	10	(X)	56.1			
35494 05	Wheel balancing equipment -----	9	(X)	30.4			
35494 07	Tire and wheel mounting equipment -----	3	(X)	(47)			
35494 09	Brake service equipment -----	5	(X)	4754.6			
35494 17	Sparkplug cleaners ----- thousands	-	-	-	13	(X)	39.0
35494 19	All other automotive maintenance equipment, except hand tools -----	13	(X)	39.0			
35494 00	Automotive maintenance equipment, except hand tools, n.s.k. -----	(NA)	(X)	.9	(NA)	(X)	-
35496 --	Gas cutting and welding equipment, including parts, attachments, and accessories -----	(NA)	(X)	226.6	(NA)	(X)	48213.7
35496 01	Torches, including welding torches and gas air torches ----- thousands	15	(S)	67.4	17	(S)	36.0
35496 05	Cutting machines and carriages, stationary and portable ----- do	9	(S)	28.5	9	(S)	28.8
35496 09	Other gas welding and cutting equipment, excluding pressure containers -----	5	(X)	19.0	11	(X)	57.0
35496 15	Spare parts, accessories, attachments, adaptors, etc., n.e.c., sold separately: -----	13	(X)	35.9	17	(X)	27.0
35496 17	Regulators, gas pressure ----- thousands	11	(S)	31.7	13	**835.7	28.7
35496 19	All other -----	14	(X)	41.1	19	(X)	30.0
35496 00	Gas cutting and welding equipment, including parts, attachments, and accessories, n.s.k. -----	(NA)	(X)	2.9	(NA)	(X)	6.3
35497 --	Other welding equipment, components, and accessories (excluding arc, resistance, and gas) -----	(NA)	(X)	152.7	(NA)	(X)	(48)
35497 61	Stud welding equipment ----- number	5	(S)	14.7	4947	(NA)	(48)
35497 63	Induction welding equipment ----- do	1	(49)	(49)			
35497 65	Electron beam welding equipment ----- do	4	4947	4921.6			
35497 67	Friction welding equipment ----- do	4	(S)	12.2			
35497 73	Plasma welding and cutting equipment ----- do	9	(S)	34.1			
35497 75	All other welding equipment -----	12	(X)	11.9	(NA)	(NA)	(48)
35497 81	Components and accessories for all other welding equipment, excluding arc welders, resistance welders, and gas welding and cutting equipment -----	13	(X)	58.2	13	(X)	71.4
35497 00	Other welding equipment, components, and accessories (excluding arc, resistance, and gas), n.s.k. -----	(NA)	(X)	-			
35495 --	Metalworking machinery, n.e.c. -----	(NA)	(X)	330.3	(NA)	(X)	294.9
35495 10	Machines for weaving and other wire fabricating and wire drawing machines and draw benches -----	38	(X)	86.3	21	(X)	53.2
35495 43	Coil handling equipment (conversion or straightening): Cut-to-length lines -----	18	(X)	63.4	17	(X)	48.9
35495 45	Slitting lines -----	9	(X)	26.7	12	(X)	18.2
35495 55	Soldering equipment (except hand and ultrasonic) ----- thousands	7	(S)	17.3	4	(X)	132.6
35495 98	Other metalworking machinery -----	63	(X)	117.2	57	(X)	132.6
35495 00	Metalworking machinery, n.e.c., n.s.k. -----	(NA)	(X)	19.4	(NA)	(X)	42.0
35490 00	Metalworking machinery, n.e.c., n.s.k., typically for establishments with 10 employees or more (see note) -----	(NA)	(X)	79.8	(NA)	(X)	71.4
35490 02	Metalworking machinery, n.e.c., n.s.k., typically for establishments with less than 10 employees (see note) -----	(NA)	(X)	19.8	(NA)	(X)	12.6

See footnotes at end of table.

Table 6a. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1982 and 1977—Con.

Note: In 1982 Census of Manufactures, data for establishments of small single-unit companies with up to 20 employees were estimated from administrative-record data rather than data actually collected from respondents. Employment cutoff used for administrative records for each industry and shipments figures are included in code ending with "002". In both 1982 and 1977 Censuses of Manufactures, products not completely identified on standard forms were coded in appropriate product class (five-digit) followed by "00" or to appropriate product group code (four-digit) followed by "000".

- ¹Data reported by all producers, not just those with shipments of \$100,000 or more.
- ²For some establishments, data have been estimated from central unit values which are based on quantity-value relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: * 10 to 19 percent estimated; ** 20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by (S).
- ³For 1977, boring machines valued less than \$2,500 each were included with product codes 35411 11 to 35411 72.
- ⁴For 1977, total for drilling machines, as reported in Current Industrial Report MQ-35W, Metalworking Machinery, included floor and pedestal sensitive drilling machines, indexing turret head vertical upright drilling machines (fixed column and table), plain and universal radial drilling machines (13-inch column or more), and automatic (combination, horizontal, vertical, and opposed heads) multiple spindle drilling machines. Total also included value of product code 35412 52 which was withheld to avoid disclosing data for individual companies.
- ⁵For 1977, product code included only machines valued less than \$1,000.
- ⁶For 1977, product code 35412 22 excluded indexing turret head vertical upright drilling machines (fixed column and table).
- ⁷For 1977, product code 35412 33 excluded 13-inch column or more.
- ⁸For 1977, product code 35412 82 was included with product code 35412 98.
- ⁹For 1977, product code 35412 68 excluded automatic multiple spindle drilling machines (combination, horizontal, vertical, and opposed heads).
- ¹⁰For 1977, total for grinding, polishing, buffing, honing, and lapping machines, as reported in Current Industrial Report MQ-35W, Metalworking Machinery, included value of product codes 35414 15, 35414 16, 35414 17, and 35414 39 which were withheld to avoid disclosing data for individual companies. For 1977, total also included vertical reciprocating table type surface grinding machines.
- ¹¹For 1982, product codes 35414 15, 35414 16, and 35414 17 are included with product code 35414 19 to avoid disclosing data for individual companies.
- ¹²For 1977, product code 35414 34 excluded the vertical type.
- ¹³For 1977, total for lathes as reported in Current Industrial Report MQ-35W, Metalworking Machinery, included value of product codes 35415 09, 35415 22, 35415 23, 35415 25, 35415 29, 35415 54, and 35415 81 which were withheld to avoid disclosing data for individual companies. Total for lathes also included single spindle automatic chucking machines without index turret.
- ¹⁴For 1977, numerically controlled lathes were included with nonnumerically controlled lathes.
- ¹⁵For 1982, product codes 35415 23, 35415 25, and 35415 29 are included with product code 35415 37 to avoid disclosing data for individual companies.
- ¹⁶For 1977, product codes 35415 63 and 35415 66 excluded single spindle automatic chucking lathes without index turret. These lathes were included in total for lathes as reported in Current Industrial Report MQ-35W, Metalworking Machinery.
- ¹⁷For 1977, product codes 35415 56, 35415 86, 35415 87, 35415 89, and 35415 90 were included with product code 35415 98.
- ¹⁸For 1977, product code 35416 53 included spar millers.
- ¹⁹For 1977, machining centers and station transfer machines, as reported in census of manufactures, were included with other metal cutting machine tools, as reported in census of manufactures.
- ²⁰For 1977, product codes 3541A 01 and 3541A 03 included indexing turret type.
- ²¹There are no equivalent data for product codes 3541A 17 and 3541A 19 for 1977.
- ²²For 1977, total for other metal cutting machine tools, as reported in Current Industrial Report MQ-35W, Metalworking Machinery, included the value for product code 3541C 53 which was withheld to avoid disclosing data for individual companies. For 1977, total also included planes and shapers (all types, except gear shapers and slotters) and contour sawing and filing machines (including band type).
- ²³For 1977, product code 3541C 61 excluded contour sawing and filing machines.
- ²⁴For 1977, product codes 3541C 67, 3541C 69, and 3541C 71 were included with product code 3541C 91.
- ²⁵For 1977, product code 35418 51 was included with product code 35418 91 to avoid disclosing data for individual companies.
- ²⁶For 1977, total for punching and shearing machines, as reported in the census of manufactures, was included with total for bending and forming machines, as reported in the census of manufactures.
- ²⁷For 1977, total for punching and shearing machines, as reported in Current Industrial Report MQ-35W, Metalworking Machinery, was included with total for bending and forming machines, as reported in Current Industrial Report MQ-35W, Metalworking Machinery.
- ²⁸For 1977, manually operated punching and shearing machines were included with product code 35421 19.
- ²⁹For 1977, product codes 35421 39, 35421 40, and 35421 41 were included with product code 35421 35.
- ³⁰For 1977, forging presses were included with product class 35422.
- ³¹For 1977, total for presses, except forging, as reported in Current Industrial Report MQ-35W, Metalworking Machinery, included value of product codes 35422 16, 35422 73, and 35422 77 which were withheld to avoid disclosing data for individual companies. Total for presses also included four-point, single-action, vertical, straight-sided, and arch-frame mechanical presses, knuckle-joint mechanical presses (all tonnages and horizontal), and automatic mechanical presses (strip or coil fed). For 1977, forging presses were included with product class 35422.
- ³²For 1977, product code 35422 45 excluded the 51-tons-and-over size range.
- ³³For 1982, product codes 35422 59 and 35422 60 are combined to avoid disclosing data for individual companies.
- ³⁴For 1977, total for other metal forming machine tools, as collected in Current Industrial Report MQ-35W, Metalworking Machinery, included gear and spline rolling machines, spinning lathes, and marking and curling machines. For 1977, forging presses were included with product class 35422.
- ³⁵For 1977, product codes 35423 27 and 35423 31 were included with product code 35423 37.
- ³⁶For 1977, product code 35423 30 was included with product code 35423 93.
- ³⁷For 1982, product codes 35423 51 and 35423 52 are combined to avoid disclosing data for individual companies.
- ³⁸For 1982, product codes 35423 53 and 35423 54 are combined to avoid disclosing data for individual companies.
- ³⁹For 1977, product codes 35442 21 and 35442 25 were included with product code 35442 62.
- ⁴⁰Single point tools are one-piece single point of multiple point tool bits with integral cutting edges or with cutting tips brazed or bonded to holder or shank; with square, rectangular, round, and other cross-section shanks; and with single and double end, including flat form and dovetail tools used for turning, planing, boring, shaping, shaving, forming, threading, cutting off, etc.; excluding circular form tools, and all mechanical holding devices and replaceable inserts.
- ⁴¹Blanks are cast or formed material, unground, and requiring further processing to make a solid tool or cutting tip. (Does not include components pressed to size, as molded ready-to-use inserts.) Tips are finished or semifinished form of blank to be brazed, soldered, or otherwise bonded to a shank to form a cutting tool. Inserts are replaceable, mechanically-held-cutting-edge components of cutting tools, either pressed to size, or ground on all surfaces (precision ground), or ground on top and bottom only (utility ground).
- ⁴²For 1982, product codes 35451 97 and 35451 99 are combined to avoid disclosing data for individual companies.
- ⁴³For 1977, product codes 35453 43 and 35453 98 were combined to avoid disclosing data for individual companies.
- ⁴⁴For 1977, product code 35452 92 included metal surface texture measuring machines.
- ⁴⁵For 1982, product codes 35461 12 and 35461 37 are combined with product code 35461 35 to avoid disclosing data for individual companies.
- ⁴⁶For 1982, product codes 35471 11 and 35471 17 are combined to avoid disclosing data for individual companies.
- ⁴⁷For 1982, product codes 35494 07 and 35494 09 were combined to avoid disclosing data for individual companies.
- ⁴⁸For 1977, data for product code 35496 — included 35497 —.
- ⁴⁹For 1982, product codes 35497 63 and 35497 65 were combined to avoid disclosing data for individual companies.

Table 6b. Product Classes—Value of Shipments by All Producers for Specified States: 1982 and 1977

[Million dollars. Product classes covered are those that are economically significant and whose production is geographically dispersed, provided dispersion is not approximated by data in table 2. Also, product classes are not shown if they are miscellaneous or "not specified by type" classes. Statistics for some States are withheld because they are either less than \$2 million in product class shipments or they disclose data for individual companies in 1982. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Product class and geographic area	1982 value of product shipments	1977 value of product shipments	Product class and geographic area	1982 value of product shipments	1977 value of product shipments
35411, BORING MACHINES			35412, DRILLING MACHINES		
United States	198.7	93.5	United States	67.3	108.9
Connecticut	30.0	3.4	Illinois	15.2	7.5
Illinois	3.9	3.2	Indiana	3.7	(CC)
Michigan	95.2	36.9	Michigan	3.9	15.7
			Ohio	15.5	12.0
			Wisconsin	10.1	4.5

See footnotes at end of table.

Table 6b. Product Classes—Value of Shipments by All Producers for Specified States: 1982 and 1977—Con.

[Million dollars. Product classes covered are those that are economically significant and whose production is geographically dispersed, provided dispersion is not approximated by data in table 2. Also, product classes are not shown if they are miscellaneous or "not specified by type" classes. Statistics for some States are withheld because they are either less than \$2 million in product class shipments or they disclose data for individual companies in 1982. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Product class and geographic area	1982 value of product shipments	1977 value of product shipments	Product class and geographic area	1982 value of product shipments	1977 value of product shipments
35413, GEAR CUTTING MACHINES			35422, PRESSES, EXCEPT FORGING		
United States	87.3	67.1	United States	369.2	282.6
Michigan	8.7	10.0	California	6.1	8.9
35414, GRINDING, POLISHING, HONING, AND LAPPING MACHINES			Connecticut	14.0	(NA)
United States	515.3	288.3	Illinois	131.7	85.7
Connecticut	35.2	18.4	Indiana	7.9	15.7
Illinois	53.4	41.1	Michigan	32.6	26.0
Michigan	48.2	28.6	New York	28.9	30.2
Minnesota	12.4	10.6	Ohio	101.4	81.0
New Jersey	4.7	(BB)	Pennsylvania	20.8	(CC)
New York	10.5	16.5	35423, METAL FORMING MACHINE TOOLS, N.E.C.		
Wisconsin	5.6	3.2	United States	217.0	171.7
35415, LATHES			California	15.3	20.3
United States	523.6	455.9	Connecticut	9.7	12.8
Connecticut	68.5	68.9	Illinois	17.1	3.2
Michigan	11.4	25.3	Michigan	19.9	32.5
New York	49.0	39.4	Ohio	87.7	58.8
Ohio	282.4	226.8	35424, PARTS FOR METAL FORMING MACHINES		
35416, MILLING MACHINES			United States	380.0	295.5
United States	264.5	167.8	California	21.3	15.5
Illinois	21.2	19.3	Connecticut	17.7	26.5
Michigan	8.0	8.0	Illinois	93.1	59.8
3541B, STATION TYPE MACHINES			Indiana	6.3	2.5
United States	735.4	(NA)	Kansas	2.4	(AA)
Connecticut	6.6	(NA)	Massachusetts	5.7	4.9
Illinois	90.2	(NA)	Michigan	52.9	48.8
Michigan	525.2	(NA)	Missouri	5.4	2.4
3541C, METAL CUTTING MACHINE TOOLS, N.E.C.			New Jersey	5.7	(BB)
United States	250.6	(NA)	New York	12.3	26.3
California	4.0	(NA)	Ohio	58.4	59.5
Connecticut	3.4	(NA)	Pennsylvania	27.6	18.6
Illinois	44.0	(NA)	Wisconsin	12.7	(NA)
Michigan	66.9	(NA)	35441, SPECIAL DIES AND TOOLS, DIE SETS, JIGS, AND FIXTURES		
Ohio	58.8	(NA)	United States	3 425.9	2 578.0
Pennsylvania	12.2	(NA)	Alabama	13.9	7.4
Wisconsin	6.7	(NA)	Arizona	8.8	(AA)
35418, MACHINE TOOLS FOR HOME WORKSHOPS			Arkansas	6.0	(BB)
United States	85.7	66.3	California	173.2	95.7
California	12.7	(BB)	Colorado	11.7	6.3
Illinois	10.2	2.4	Connecticut	69.9	45.0
Michigan	5.4	10.6	Florida	26.5	22.1
Ohio	22.8	(BB)	Georgia	15.1	6.6
35419, PARTS FOR METAL CUTTING MACHINE TOOLS			Illinois	247.0	164.5
United States	891.9	502.1	Indiana	148.9	137.4
California	22.5	6.2	Iowa	16.4	17.1
Connecticut	60.1	46.2	Kansas	3.8	2.7
Illinois	85.9	49.6	Kentucky	11.4	9.0
Indiana	16.7	6.8	Maine	4.9	2.4
Massachusetts	26.2	9.7	Maryland	9.7	6.1
Michigan	165.1	66.2	Massachusetts	54.1	38.5
Minnesota	20.6	(EE)	Michigan	1 248.7	1 022.6
New Jersey	2.1	(AA)	Minnesota	45.6	17.2
New York	66.9	23.6	Mississippi	7.0	(AA)
North Carolina	5.3	(AA)	Missouri	52.2	37.1
Ohio	210.8	148.1	Nebraska	3.0	(AA)
Pennsylvania	40.8	16.0	New Hampshire	3.8	2.5
Rhode Island	15.5	13.1	New Jersey	67.2	80.1
Texas	5.6	(NA)	New York	197.7	104.3
Vermont	23.6	29.3	North Carolina	19.3	7.4
Wisconsin	67.7	48.5	Ohio	507.7	408.5
35421, PUNCHING, SHEARING, BENDING, AND FORMING MACHINES			Oregon	2.4	(NA)
United States	317.3	280.1	Pennsylvania	253.5	192.8
California	23.9	12.3	South Carolina	8.7	4.1
Connecticut	2.6	8.1	Tennessee	31.4	19.4
Illinois	70.0	76.3	Texas	30.8	13.2
Indiana	16.9	(CC)	Virginia	8.2	(BB)
Michigan	22.4	12.8	Washington	2.4	(AA)
Missouri	7.1	3.3	Wisconsin	95.4	79.5
Ohio	57.6	54.3			
Pennsylvania	19.6	(FF)			
Texas	2.1	(CC)			
Wisconsin	5.3	(AA)			

See footnotes at end of table.

Table 6b. Product Classes—Value of Shipments by All Producers for Specified States: 1982 and 1977—Con.

[Million dollars. Product classes covered are those that are economically significant and whose production is geographically dispersed, provided dispersion is not approximated by data in table 2. Also, product classes are not shown if they are miscellaneous or "not specified by type" classes. Statistics for some States are withheld because they are either less than \$2 million in product class shipments or they disclose data for individual companies in 1982. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Product class and geographic area	1982 value of product shipments	1977 value of product shipments	Product class and geographic area	1982 value of product shipments	1977 value of product shipments
35442, INDUSTRIAL MOLDS			35453, MACHINE TOOL ACCESSORIES, N.E.C.		
United States	1 800.6	1 040.0	United States	593.6	430.9
Alabama	5.9	3.4	California	19.9	9.8
Arizona	11.0	2.1	Connecticut	58.1	55.6
Arkansas	3.8	(AA)	Illinois	49.9	42.2
California	145.9	67.7	Indiana	16.3	14.0
Colorado	5.6	3.4	Massachusetts	8.1	8.8
Connecticut	41.1	22.9	Michigan	148.5	101.0
Florida	25.0	11.2	New Jersey	9.0	4.6
Georgia	5.5	3.7	New York	30.2	27.0
Illinois	232.1	131.4	Ohio	85.7	61.2
Indiana	94.3	59.5	Pennsylvania	36.2	27.1
Iowa	6.8	(BB)	Tennessee	3.1	(NA)
Kansas	5(AA)	.9	Texas	23.3	(EE)
Kentucky	7.6	4.9	Wisconsin	13.8	12.7
Maine	3.1	(AA)			
Massachusetts	76.5	52.5	35461, ELECTRIC, INCLUDING BATTERY POWERED		
Michigan	314.6	176.9	United States	829.9	748.7
Minnesota	46.6	25.6	California	6.1	(BB)
Missouri	35.8	20.3	Connecticut	20.2	(EE)
New Hampshire	11.0	2.2	Illinois	78.7	100.6
New Jersey	110.2	65.1	Ohio	5.6	28.0
New York	70.7	50.5	35462, PNEUMATIC, HYDRAULIC, AND POWDER-ACTUATED		
North Carolina	16.8	7.7	United States	382.4	371.1
Ohio	246.5	178.0	California	17.6	14.9
Oklahoma	2.7	(AA)	Illinois	20.7	44.8
Oregon	4.5	3.1	Massachusetts	11.4	(BB)
Pennsylvania	147.3	79.4	Ohio	70.0	80.4
Rhode Island	4.8	5.0			
South Carolina	6.6	4.0	35473, ROLLING MILL MACHINERY, N.E.C.		
Tennessee	7.5	4.5	United States	188.2	120.8
Texas	21.7	7.1	Illinois	12.2	(BB)
Virginia	2.2	2.7	Ohio	48.3	36.2
Washington	5.7	(BB)	Pennsylvania	58.3	49.0
Wisconsin	66.3	29.8			
35451, SMALL CUTTING TOOLS FOR MACHINE TOOLS			35492, ASSEMBLY MACHINES		
United States	1 755.7	1 376.4	United States	367.6	128.4
Alabama	27.0	(NA)	California	2.7	(AA)
Arkansas	28.6	(FF)	Connecticut	12.2	(CC)
California	57.5	37.4	Illinois	22.7	4.0
Connecticut	45.1	43.7	Indiana	16.1	10.5
Florida	15.9	(BB)	Michigan	168.9	43.0
Georgia	35.9	(EE)	Minnesota	5.2	(BB)
Illinois	162.3	143.7	Ohio	24.6	10.5
Indiana	22.5	12.6			
Iowa	10.1	3.5	35494, AUTOMOTIVE MAINTENANCE EQUIPMENT, EXCEPT HAND TOOLS		
Kentucky	6.9	(EE)	United States	200.3	188.0
Massachusetts	141.0	129.2	California	7.6	6.8
Michigan	414.3	397.2	Iowa	17.1	25.5
Missouri	5.8	2.5	Minnesota	10.6	(EE)
New Jersey	50.4	39.4			
New York	72.4	60.4	35495, METALWORKING MACHINERY, N.E.C.		
North Carolina	39.3	(CC)	United States	330.3	294.9
Ohio	255.7	171.9	California	18.3	15.3
Pennsylvania	82.1	133.4	Connecticut	18.8	8.9
Rhode Island	19.1	16.2	Illinois	27.8	36.5
South Carolina	73.1	21.3	Indiana	12.2	6.9
Texas	15.8	6.4	Massachusetts	26.1	13.2
Vermont	41.7	37.5	Michigan	16.5	38.6
Virginia	3.2	(AA)	New Jersey	26.0	17.3
Wisconsin	49.2	26.3	New York	21.6	36.3
			North Carolina	3.1	5.7
			Ohio	45.7	47.4
35452, PRECISION MEASURING TOOLS			35496, GAS CUTTING AND WELDING EQUIPMENT		
United States	402.7	208.2	United States	226.6	(NA)
California	15.2	11.3	California	8.8	(NA)
Connecticut	16.9	7.1	Illinois	17.5	(NA)
Illinois	5.6	5.8	Minnesota	6.3	(NA)
Indiana	6.4	3.8	Ohio	19.3	(NA)
Michigan	101.1	24.7	Pennsylvania	13.1	(NA)
Minnesota	11.0	(BB)			
New York	32.0	15.3	35497, OTHER WELDING EQUIPMENT		
Ohio	63.8	46.1	United States	152.7	(NA)
Texas	2.2	(AA)	California	8.9	(NA)
			Connecticut	15.0	(NA)
			Michigan	7.9	(NA)
			Ohio	13.4	(NA)

Note: For 1977, the following value ranges (in million dollars) substitute for actual figures withheld to avoid disclosing data for individual companies: AA—less than \$2.0 but not 0; BB—\$2.0 to \$4.9; CC—\$5.0 to \$9.9; EE—\$10.0 to \$19.9; FF—\$20.0 to \$49.9; GG—\$50.0 or more.

Table 6c. Product Classes—Value Shipped by All Producers: 1982 and Earlier Years

(Million dollars. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes)

1982 prod- uct code	Product class	1982	1981 ¹	1980 ¹	1979 ¹	1978 ¹	1977	1972	1967
3541-	Machine tools, metal cutting types	4 154.7	5 554.0	4 952.3	4 127.5	3 377.1	2 560.5	1 258.5	1 907.8
35411	Boring machines	198.7	227.0	200.0	169.9	133.0	93.5	58.7	127.8
35412	Drilling machines	67.3	155.0	188.8	167.1	155.0	108.9	73.7	128.5
35413	Gear cutting machines	87.3	132.5	124.7	104.6	111.5	67.1	56.7	67.1
35414	Grinding, polishing, honing, and lapping machines	515.3	623.3	553.8	464.5	359.5	288.3	168.6	270.2
35415	Lathes	523.6	865.3	823.0	675.7	554.9	455.9	197.6	360.5
35416	Milling machines	264.5	390.4	322.0	259.3	204.8	167.8	86.6	258.2
3541A	Machining centers	365.7	1 713.2	1 491.2	1 166.2	889.2	647.3	(²)	(²)
3541B	Station type machines	735.4						(²)	(²)
3541C	Metal cutting machine tools, n.e.c.	250.6						(²)	(²)
35418	Machine tools for home workshops	85.7	125.1	129.6	113.1	105.6	66.3	³ 303.1	³ 371.9
35419	Parts for metal cutting machine tools	891.9	1 038.2	877.3	813.7	606.0	502.1	242.1	241.0
35410	Machine tools, metal cutting types, n.s.k.	168.7	284.0	241.8	193.3	(S)	163.3	71.4	82.5
3542-	Machine tools, metal forming types	1 383.9	1 652.1	1 749.2	1 634.8	1 357.9	1 114.7	670.1	676.6
35421	Punching, shearing, bending, and forming machines	317.3	444.1	429.0	389.9	320.4	280.1	153.4	130.9
35422	Presses, except forging	369.2	422.7	498.5	449.5	369.1	282.6	183.2	261.3
35423	Metal forming machine tools, n.e.c.	217.0	221.4	238.9	264.4	220.3	171.7	149.0	122.9
35424	Parts for metal forming machines	380.0	498.4	530.8	482.5	400.5	295.5	161.5	125.7
35420	Machine tools, metal forming types, n.s.k.	100.5	65.5	52.0	48.5	(S)	85.0	23.0	35.6
3544-	Special dies, tools, jigs, and fixtures	6 099.3	6 975.2	6 165.3	5 732.6	5 058.8	4 450.2	2 713.5	2 520.2
35441	Special dies and tools, die sets, jigs, and fixtures	3 425.9	4 248.5	3 616.7	3 575.6	3 011.5	2 578.0	1 520.1	³ 1 719.8
35442	Industrial molds	1 800.6	1 545.1	1 497.8	1 281.2	1 151.6	1 040.0	640.3	³ 446.2
35440	Special dies, tools, jigs, and fixtures, n.s.k.	872.8	1 181.5	1 050.9	875.8	(S)	832.2	553.1	354.2
3545-	Machine tool accessories	3 069.1	3 854.0	3 531.1	3 205.4	2 676.6	2 238.9	1 151.4	1 222.4
35451	Small cutting tools for machine tools	1 755.7	2 352.5	2 199.4	2 023.6	1 651.7	1 376.4	738.0	770.9
35452	Precision measuring tools	402.7	517.2	414.7	360.6	292.7	208.2	94.7	130.8
35453	Machine tool accessories, n.e.c.	593.6	755.2	738.4	680.2	532.0	430.9	218.8	239.5
35450	Machine tool accessories, n.s.k.	317.1	229.1	178.6	141.0	(S)	223.5	99.9	81.2
3546-	Power driven hand tools⁴	1 594.8	1 983.3	2 083.8	1 910.7	1 694.0	1 496.5	725.0	(NA)
35461	Electric, including battery powered	829.9	924.7	964.2	875.7	813.5	748.7	386.9	(⁵)
35462	Pneumatic, hydraulic, and powder-actuated ⁶	382.4	557.0	504.1	523.7	439.1	371.1	320.0	(⁵)
35463	Engine (internal combustion) driven ⁶	326.5	466.4	592.8	492.2	416.4	347.1	18.1	⁵ 436.0
35460	Power driven hand tools, n.s.k.	56.0	35.1	22.6	19.1	(S)	29.6		(⁷)
3547-	Rolling mill machinery	445.1	631.2	566.6	406.8	334.1	361.0	247.9	(NA)
35471	Hot rolling mill machinery, except tube rolling	180.5	197.9	228.4	152.7	111.8	147.0	134.7	330.3
35472	Cold rolling mill machinery	65.1	130.8	132.2	106.5	86.8	74.9	52.4	
35473	Rolling mill machinery, n.e.c.	188.2	278.1	186.3	128.9	118.7	120.8	55.6	
35470	Rolling mill machinery, n.s.k.	11.4	24.3	(S)	18.7	(S)	18.3	5.2	(⁷)
3549-	Metalworking machinery, n.e.c.	1 376.9	1 463.3	1 402.7	1 232.4	1 075.6	908.9	411.3	(NA)
35492	Assembly machines	367.6	342.4	288.0	255.0	225.5	128.4	(⁸)	(⁸)
35494	Automotive maintenance equipment, except hand tools	200.3	276.5	279.1	261.4	201.5	188.0	111.1	58.1
35495	Metalworking machinery, n.e.c.	330.3	422.4	469.2	385.7	338.6	294.9	⁸ 154.5	⁸ 86.2
35496	Gas cutting and welding equipment	226.6	326.9	275.5	256.4	239.4	213.7	93.7	69.6
35497	Other welding equipment	152.7							
35490	Metalworking machinery, n.e.c., n.s.k.	99.5							

¹Figures are estimates derived from a representative sample of manufacturing establishments canvassed in annual survey of manufactures and, therefore, may differ from results that would be obtained from a complete canvass of all manufacturing establishments. Standard errors associated with estimates are published in annual survey of manufactures volumes for this period.

²For 1972 and 1967, product classes 3541A, 3541B, and 3541C were included with product class 35418.

³For 1967 and later years, diecasting dies (molds) were included in product class 35442. Prior to 1967, these molds were included in product class 35441.

⁴For 1977 and later years, chain saws and parts were classified in industry 3546. Prior to 1977, chain saws and parts were classified in industry 3553.

⁵For 1967, product classes 35461 and 35462 were included with product class 35463.

⁶Prior to 1977, hydraulic and internal combustion engine driven hand tools and parts (excluding chain saws and parts) were classified in industry 3546, but not collected separately.

⁷Prior to 1972, product class 35490 included product classes 35460 and 35470.

⁸Prior to 1977, data for product class 35492 were combined with product class 35495.

Table 7. Materials Consumed by Kind: 1982 and 1977

(Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text)

1982 material code	Material	1982		1977	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
	INDUSTRY 3541, MACHINE TOOLS, METAL CUTTING TYPES				
	Materials, parts, containers, and supplies	(X)	1 380.0	(X)	904.4
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes	(S)	35.1	(S)	25.9
331012	Sheet and strip	(S)	9.2	(S)	5.5
331013	Plates	(S)	13.1	(S)	18.0
331015	Structural shapes	(S)	9.0	(S)	4.2
331017	Wire and wire products	(S)		(S)	
331019	All other carbon steel mill shapes and forms	(S)	3.2	(S)	9.5

See footnotes at end of table.

Table 7. Materials Consumed by Kind: 1982 and 1977—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 material code	Material	1982		1977	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
	INDUSTRY 3541, MACHINE TOOLS, METAL CUTTING TYPES—Con.				
	Mill shapes and forms, except castings and forgings—Con.				
	Alloy steel, except stainless:				
331021	Bars and bar shapes ----- 1,000 s tons..	(S)	15.1	**20.0	20.5
331029	All other alloy steel mill shapes and forms ----- do..	(S)	3.7	(S)	2.7
	Stainless steel:				
331033	Sheet and strip ----- do..	(S)	.9	(S)	.8
331050	All other stainless steel mill shapes and forms ----- do..	(S)	.7	(S)	2.2
	Insulated wire and cable, except magnet wire:				
335792	Copper (quantity of copper content) ----- mil lb..	(S)	6.2	*3.6	3.7
335793	Aluminum (quantity of aluminum content) ----- do..	(D)	(³)	(X)	(⁴)
335770	Magnet wire ----- do..	(D)	(³)	(X)	(⁴)
	Copper and copper-base alloy:				
335728	Bare wire for electrical conduction ----- do..	(S)	.1	**2	.1
335102	Rod, bar, and mechanical wire, including extruded and/or drawn shapes ----- do..	(S)	1.4	(S)	1.1
335143	Plate, sheet, and strip, including military cups and discs ----- do..	(S)	.5	(S)	.6
335152	Pipe and tube ----- do..				
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ----- do..	(S)	1.8	(S)	.8
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. ----- do..	(S)	1.0	(S)	.5
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) ----- do..	(S)	.6	(S)	.4
335609	Nonferrous metal mill shapes and forms, except copper and aluminum ----- do..	(S)	1.4	(D)	(⁴)
329903	Industrial diamonds ----- carats..	(S)	.8	(S)	1.4
329101	Grinding wheels and other abrasive products, except industrial diamonds ----- do..	(X)	10.0	(X)	5.6
	Metal powders:				
339916	Tungsten carbide ----- mil lb..	(S)	.9	(S)	.2
339919	All other ----- do..	(S)			
190023	Iron and steel scrap, excluding home scrap ----- 1,000 s tons..	(S)	2.3	6.5	1.1
	Castings (rough and semifinished):				
332011	Iron (gray and malleable):				
	Purchased ----- do..	(S)	88.0	**77.9	84.5
	Produced and consumed ----- do..	7.3	(X)	(S)	(X)
332045	Steel:				
	Purchased ----- do..	(S)	54.6	(S)	8.7
	Produced and consumed ----- do..	(D)	(X)	(S)	(X)
336100	Aluminum and aluminum-base alloy:				
	Purchased ----- mil lb..	(S)	3.0	(S)	6.0
	Produced and consumed ----- do..	(D)	(X)	(S)	(X)
336200	Copper and copper-base alloy:				
	Purchased ----- do..	(S)	1.2	**1.7	2.5
	Produced and consumed ----- do..	-	(X)	(S)	(X)
336902	Other nonferrous:				
	Purchased ----- do..	(D)	(³)	(X)	(⁴)
	Produced and consumed ----- do..	-	(X)	(X)	(X)
346200	Iron and steel forgings:				
	Purchased ----- 1,000 s tons..	(S)	15.4	*5.9	8.7
	Produced and consumed ----- do..	-	(X)	(S)	(X)
349421	Fluid power (hydraulic and pneumatic) valves ----- do..	(X)	11.3	(X)	(⁴)
349461	Fluid power (hydraulic and pneumatic) hose or tube fittings and assemblies ----- do..	(X)	5.9	(X)	(⁴)
	Engines:				
351920	Diesel and semidiesel:				
	Purchased ----- thousands..	(D)	(³)	(X)	(⁴)
	Produced and consumed ----- do..	-	(X)	(X)	(X)
351901	Gasoline and other carburetor:				
	Purchased ----- do..	(Z)	(Z)	(X)	(⁴)
	Produced and consumed ----- do..	-	(X)	(X)	(X)
	Electric motors and generators:				
362110	Fractional horsepower electric motors (less than 1 hp):				
	Timing motors, synchronous and subsynchronous:				
	Purchased ----- do..	(S)	21.7	**1.9	1.1
	Produced and consumed ----- do..	-	(X)	(S)	(X)
362115	Other fractional horsepower electric motors:				
	Purchased ----- do..	(S)	5.1	(S)	5.9
	Produced and consumed ----- do..	(D)	(X)	(S)	(X)
362120	Integral horsepower motors and generators (1 hp or more):				
	Purchased ----- do..	(S)	35.1	(S)	26.3
	Produced and consumed ----- do..	.9	(X)	(S)	(X)
	Bearings:				
356218	Ball ----- do..	(X)	17.6	(X)	11.8
356201	Roller ----- do..	(X)	8.3	(X)	6.8
356601	Speed changers, drives, gears, and industrial high speed drives ----- do..	(X)	17.4	(X)	14.7
	Pumps (complete assemblies):				
356120	Hydraulic fluid power pumps, motors, and hydrostatic transmissions ----- thousands..	(S)	10.6	(⁵)	(⁵)
356102	Other pumps ----- do..	(S)	1.3	(X)	(⁴)
356301	Air and gas compressors ----- do..	(S)	1.1	(X)	(⁴)
356921	Filters for hydraulic fluid power systems ----- do..	(X)	2.1	(X)	(⁵)
359921	Fluid power (hydraulic and pneumatic) cylinders and rotary actuators ----- do..	(X)	6.1	(X)	(⁵)
359922	Hydraulic and pneumatic equipment (except pumps, compressors, cylinders, and rotary actuators) ----- do..	(X)	13.9	(X)	523.4
360101	Electric transmission, distribution, and control equipment ----- do..	(X)	33.2	(X)	33.4
265001	Paperboard containers, boxes, and corrugated paperboard ----- 1,000 s tons..	(S)	1.2	(X)	(⁴)
280001	Industrial chemicals ----- do..	(X)	(³)	(X)	(⁴)
304101	Rubber and plastics hose and belting ----- do..	(X)	2.3	(X)	(⁴)
306902	Fabricated rubber products (except tires, tubes, hose, belting, and gaskets) ----- do..	(X)	.3	(X)	(⁴)
329300	Gaskets (all types) and asbestos packing ----- do..	(X)	1.0	(X)	(⁴)
345001	Bolts, nuts, screws, rivets, and screw machine products ----- do..	(X)	16.0	(X)	10.0
354501	Cutting tools for machine tools ----- do..	(X)	36.1	(X)	16.6

See footnotes at end of table.

Table 7. Materials Consumed by Kind: 1982 and 1977—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 material code	Material	1982		1977	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
	INDUSTRY 3541, MACHINE TOOLS, METAL CUTTING TYPES—Con.				
362001	Electrical industrial capacitors, resistors, rheostats, and coil windings -----	(X)	20.9	(X)	(⁴)
362203	Numerical controls for metalworking machinery (except programmable) -----	(X)	34.2	}	(X) 60.9
362204	Programmable controllers for metalworking machinery -----	(X)	83.4		
970099	All other materials and components, parts, containers, and supplies -----	(X)	3442.2	(X)	4312.4
971000	Materials, parts, containers, and supplies, n.s.k. ² -----	(X)	272.5	(X)	165.9
	INDUSTRY 3542, MACHINE TOOLS, METAL FORMING TYPES				
	Materials, parts, containers, and supplies -----	(X)	512.8	(X)	395.7
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ----- 1,000 s tons -----	(S)	18.9	**24.5	14.2
331012	Sheet and strip ----- do -----	(S)	1.8	**13.9	6.4
331013	Plates ----- do -----	**52.5	26.7	*74.4	26.1
331015	Structural shapes ----- do -----	(S)	4.6	(S)	3.8
331017	Wire and wire products ----- do -----	(S)	1.8	*.6	1.0
331019	All other carbon steel mill shapes and forms ----- do -----	(S)	4.2	(S)	6.8
	Alloy steel, except stainless:				
331021	Bars and bar shapes ----- do -----	(S)	7.1	(S)	6.5
331029	All other alloy steel mill shapes and forms ----- do -----	(S)	.4	12.0	5.6
	Stainless steel:				
331033	Sheet and strip ----- do -----	}	.8	**1	.2
331050	All other stainless steel mill shapes and forms ----- do -----			(S)	.5
	Insulated wire and cable, except magnet wire:				
335792	Copper (quantity of copper content) ----- mil lb -----	(S)	1.2	(D)	(⁶)
335793	Aluminum (quantity of aluminum content) ----- do -----	(D)	(7)	(X)	(⁸)
335770	Magnet wire ----- do -----	-	-	(X)	(⁸)
	Copper and copper-base alloy:				
335728	Bare wire for electrical conduction ----- do -----	(S)	(⁹)	(S)	6.9
335102	Rod, bar, and mechanical wire, including extruded and/or drawn shapes ----- do -----	(S)	.8	*.8	1.2
335143	Plate, sheet, and strip, including military cups and discs ----- do -----	(S)	*18.0	(Z)	(Z)
335152	Pipe and tube ----- do -----	(S)	.2	(S)	.3
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ----- do -----	(S)	.5	(¹⁰)	(¹⁰)
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. ----- do -----	}	(Z)	10**1.1	102.5
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) ----- do -----			(D)	(¹¹)
335609	Nonferrous metal mill shapes and forms, except copper and aluminum ----- do -----	(D)	(7)	(S)	11.2
329903	Industrial diamonds ----- carats -----	.1	(Z)	(Z)	(Z)
329101	Grinding wheels and other abrasive products, except industrial diamonds -----	(X)	1.5	(X)	1.4
	Metal powders:				
339916	Tungsten carbide ----- mil lb -----	(D)	(7)	(Z)	(Z)
339919	All other ----- do -----	(Z)	(Z)	(Z)	(Z)
190023	Iron and steel scrap, excluding home scrap ----- 1,000 s tons -----	(S)	.3	(S)	.7
	Castings (rough and semifinished):				
332011	Iron (gray and malleable):				
	Purchased ----- do -----	(S)	27.0	(S)	29.4
	Produced and consumed ----- do -----	(D)	(X)	(S)	(X)
332045	Steel:				
	Purchased ----- do -----	(S)	16.6	*12.4	18.8
	Produced and consumed ----- do -----	(D)	(X)	(S)	(X)
336100	Aluminum and aluminum-base alloy:				
	Purchased ----- mil lb -----	(S)	2.4	*2.6	2.9
	Produced and consumed ----- do -----	-	(X)	(S)	(X)
336200	Copper and copper-base alloy:				
	Purchased ----- do -----	(S)	2.9	(S)	1.5
	Produced and consumed ----- do -----	-	(X)	(S)	(X)
336902	Other nonferrous:				
	Purchased ----- do -----	(S)	.4	(⁸)	(⁸)
	Produced and consumed ----- do -----	-	(X)	(X)	(X)
346200	Iron and steel forgings:				
	Purchased ----- 1,000 s tons -----	(S)	13.8	**8.2	11.3
	Produced and consumed ----- do -----	-	(X)	(S)	(X)
349421	Fluid power (hydraulic and pneumatic) valves -----	(X)	3.5	(X)	(⁸)
349461	Fluid power (hydraulic and pneumatic) hose or tube fittings and assemblies -----	(X)	.9	(X)	(⁸)
	Engines:				
351920	Diesel and semidiesel:				
	Purchased ----- thousands -----	-	-	(X)	(⁸)
	Produced and consumed ----- do -----	-	(X)	(X)	(X)
351901	Gasoline and other carburetor:				
	Purchased ----- do -----	(D)	(7)	(X)	(⁸)
	Produced and consumed ----- do -----	-	(X)	(X)	(X)
	Electric motors and generators:				
	Fractional horsepower electric motors (less than 1 hp):				
	Timing motors, synchronous and subsynchronous:				
	Purchased ----- do -----	(S)	3.0	1.9	1.0
	Produced and consumed ----- do -----	-	(X)	(S)	(X)
362115	Other fractional horsepower electric motors:				
	Purchased ----- do -----	(S)	2.1	(S)	1.7
	Produced and consumed ----- do -----	-	(X)	(S)	(X)
362120	Integral horsepower motors and generators (1 hp or more):				
	Purchased ----- do -----	(S)	6.7	(S)	12.6
	Produced and consumed ----- do -----	(D)	(X)	(S)	(X)
	Bearings:				
356218	Ball -----	(X)	3.2	(X)	3.8
356201	Roller -----	(X)	6.3	(X)	3.8

See footnotes at end of table.

Table 7. Materials Consumed by Kind: 1982 and 1977—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 material code	Material	1982		1977	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
	INDUSTRY 3542, MACHINE TOOLS, METAL FORMING TYPES—Con.				
356601	Speed changers, drives, gears, and industrial high speed drives -----	(X)	5.7	(X)	6.3
356120	Pumps (complete assemblies):				
	Hydraulic fluid power pumps, motors, and hydrostatic transmissions ----- thousands -----	(S)	6.6	(⁵)	(⁵)
356102	Other pumps ----- do -----	(S)	.4	(X)	(⁶)
356301	Air and gas compressors ----- do -----	(D)	(7)	(X)	(⁶)
356921	Filters for hydraulic fluid power systems -----	(X)	.4	(X)	(⁶)
359921	Fluid power (hydraulic and pneumatic) cylinders and rotary actuators -----	(X)	3.5	(X)	(⁵)
359922	Hydraulic and pneumatic equipment (except pumps, compressors, cylinders, and rotary actuators) -----	(X)	3.6	(X)	⁵ 13.6
360101	Electric transmission, distribution, and control equipment -----	(X)	6.2	(X)	12.3
265001	Paperboard containers, boxes, and corrugated paperboard ----- 1,000 s tons -----	(S)	.7	(X)	(⁶)
280001	Industrial chemicals -----	(X)	.3	(X)	(⁶)
304101	Rubber and plastics hose and belting -----	(X)	.5	(X)	(⁶)
306902	Fabricated rubber products (except tires, tubes, hose, belting, and gaskets) -----	(X)	.5	(X)	(⁶)
329300	Gaskets (all types) and asbestos packing -----	(X)	.3	(X)	(⁶)
345001	Bolts, nuts, screws, washers, rivets, and screw machine products -----	(X)	4.3	(X)	5.5
354501	Cutting tools for machine tools -----	(X)	4.0	(X)	5.0
362001	Electrical industrial capacitors, resistors, rheostats, and coil windings -----	(X)	.9	(X)	(⁶)
362203	Numerical controls for metalworking machinery (except programmable) -----	(X)	1.9	}	(X)
362204	Programmable controllers for metalworking machinery -----	(X)	6.1		
970099	All other materials and components, parts, containers, and supplies -----	(X)	⁷ 139.5	(X)	⁸ 102.6
971000	Materials, parts, containers, and supplies, n.s.k. ² -----	(X)	166.9	(X)	80.3
	INDUSTRY 3544, SPECIAL DIES, TOOLS, JIGS, AND FIXTURES				
	Materials, parts, containers, and supplies -----	(X)	1 131.6	(X)	907.3
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ----- 1,000 s tons -----	(S)	52.3	(S)	41.9
331012	Sheet and strip ----- do -----	(S)	17.0	(S)	16.2
331013	Plates ----- do -----	(S)	48.1	^{**} 81.6	36.0
331015	Structural shapes ----- do -----	(S)	7.3	(S)	2.9
331017	Wire and wire products ----- do -----	(S)	.4	^{**} .4	.8
331019	All other carbon steel mill shapes and forms ----- do -----	(S)	9.0	(S)	5.9
	Alloy steel, except stainless:				
331021	Bars and bar shapes ----- do -----	(S)	60.5	(S)	47.6
331029	All other alloy steel mill shapes and forms ----- do -----	(S)	18.6	(S)	21.4
	Stainless steel:				
331033	Sheet and strip ----- do -----	(S)	5.0	(S)	4.1
331050	All other stainless steel mill shapes and forms ----- do -----	(S)	7.4	(S)	3.2
	Insulated wire and cable, except magnet wire:				
335792	Copper (quantity of copper content) ----- mil lb -----	(S)	.2	(S)	.1
335793	Aluminum (quantity of aluminum content) ----- do -----	(S)	.2	(S)	.1
335770	Magnet wire ----- do -----	(S)	.2	(S)	.1
	Copper and copper-base alloy:				
335728	Bare wire for electrical conduction ----- do -----	(S)	.3	.1	.1
335102	Rod, bar, and mechanical wire, including extruded and/or drawn shapes ----- do -----	(S)	1.9	(S)	1.4
335143	Plate, sheet, and strip, including military cups and discs ----- do -----	(S)	4.8	(S)	4.7
335152	Pipe and tube ----- do -----	(S)	.5	(S)	.2
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ----- do -----	(S)	7.7	(S)	5.5
335405	Extruded shapes, including rod, bar, pipe, tube, etc. ----- do -----	(S)	3.4	(S)	2.2
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) ----- do -----	(S)	1.1	(S)	2.2
335609	Nonferrous metal mill shapes and forms, except copper and aluminum ----- do -----	(Z)	.9	(X)	2.6
329903	Industrial diamonds ----- carats -----	(S)	3.0	(S)	2.8
	Metal powders:				
339916	Tungsten carbide ----- mil lb -----	(S)	14.7	}	[*] 1.1
339919	All other ----- do -----	^{**} .5	3.3		
190023	Iron and steel scrap, excluding home scrap ----- 1,000 s tons -----	^{**} 3.8	1.2	(S)	.2
	Castings (rough and semifinished):				
332011	Iron (gray and malleable):				
	Purchased ----- do -----	(S)	28.0	^{**} 48.0	37.4
	Produced and consumed ----- do -----	6.3	(X)	(S)	(X)
332045	Steel:				
	Purchased ----- do -----	(S)	7.9	(S)	7.0
	Produced and consumed ----- do -----	(D)	(X)	(S)	(X)
336100	Aluminum and aluminum-base alloy:				
	Purchased ----- mil lb -----	(S)	4.9	(S)	7.9
	Produced and consumed ----- do -----	(D)	(X)	(S)	(X)
336200	Copper and copper-base alloy:				
	Purchased ----- do -----	(S)	4.0	.3	1.0
	Produced and consumed ----- do -----	(Z)	(X)	(S)	(X)
336902	Other nonferrous:				
	Purchased ----- do -----	(S)	2.7	(X)	(¹²)
	Produced and consumed ----- do -----	(Z)	(X)	(X)	(X)
346200	Iron and steel forgings:				
	Purchased ----- 1,000 s tons -----	^{**} 1.4	2.4	^{**} 1.9	3.8
	Produced and consumed ----- do -----	(Z)	(X)	(S)	(X)
	Electric motors and generators:				
	Fractional horsepower electric motors (less than 1 hp):				
362110	Timing motors, synchronous and subsynchronous:				
	Purchased ----- thousands -----	(S)	.2	(S)	.3
	Produced and consumed ----- do -----	(Z)	(X)	(S)	(X)

See footnotes at end of table.

Table 7. Materials Consumed by Kind: 1982 and 1977—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 material code	Material	1982		1977	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
	INDUSTRY 3544, SPECIAL DIES, TOOLS, JIGS, AND FIXTURES—Con.				
	Electric motors and generators—Con.				
	Fractional horsepower electric motors (less than 1 hp)— Con.				
362115	Other fractional horsepower electric motors (less than 1 hp):				
	Purchased thousands..	(S)	.6	(S)	.4
	Produced and consumed do..	(D)	(X)	(S)	(X)
362120	Integral horsepower motors and generators (1 hp or more):				
	Purchased do..	(S)	.6	(S)	.6
	Produced and consumed do..	.1	(X)	(S)	(X)
	Bearings:				
356218	Ball	(X)	.7	(X)	.6
356201	Roller	(X)	.4	(X)	.7
356601	Speed changers, drives, gears, and industrial high speed drives	(X)	.8	(X)	.7
356011	Hydraulic and pneumatic equipment, including pumps and compressors	(X)	4.7	(X)	3.2
360101	Electric transmission, distribution, and control equipment	(X)	2.9	(X)	1.9
329101	Grinding wheels and other abrasive products, except industrial diamonds	(X)	9.0	(X)	7.2
345001	Bolts, nuts, screws, washers, rivets, and screw machine products	(X)	10.1	(X)	7.4
970099	All other materials and components, parts, containers, and supplies	(X)	203.6	(X)	¹² 210.8
971000	Materials, parts, containers, and supplies, n.s.k. ²	(X)	579.3	(X)	404.5
	INDUSTRY 3545, MACHINE TOOL ACCESSORIES				
	Materials, parts, containers, and supplies	(X)	778.8	(X)	673.1
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes 1,000 s tons..	(S)	37.1	(S)	29.2
331012	Sheet and strip	(S)	1.5	*2.8	2.3
331013	Plates do..	(S)	3.7	*2.8	1.9
331015	Structural shapes do..	(S)	1.5	(S)	.9
331017	Wire and wire products do..	(S)	4.7	*3.1	5.8
331019	All other carbon steel mill shapes and forms do..	(S)	10.1	(S)	9.2
	Alloy steel, except stainless:				
331021	Bars and bar shapes do..	(S)	119.4	(S)	73.5
331029	All other alloy steel mill shapes and forms do..	(S)	20.1	**6.5	15.1
	Stainless steel:				
331033	Sheet and strip	*.7	1.8	2.5	8.0
331050	All other stainless steel mill shapes and forms do..	(S)	4.9		
	Insulated wire and cable, except magnet wire:				
335792	Copper (quantity of copper content) mil lb..	]	.3	(D)	(13)
335793	Aluminum (quantity of aluminum content) do..				
335770	Magnet wire do..				
	Copper and copper-base alloy:				
335728	Bare wire for electrical conduction do..	(Z)	.1	-	-
335102	Rod, bar, and mechanical wire, including extruded and/or drawn shapes do..	(S)	.4	(S)	.3
335143	Plate, sheet, and strip, including military cups and discs do..	(S)	.3	.1	.2
335152	Pipe and tube do..	*.1	.2		
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil do..	(S)	.6	(S)	.6
335405	Extruded shapes, including rod, bar, pipe, tube, etc. do..	(S)	.9	.4	.9
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) do..	(S)	.2	(S)	.1
335609	Nonferrous metal mill shapes and forms, except copper and aluminum do..	(S)	2.7	(S)	7.1
329903	Industrial diamonds carats	(S)	9.2	(S)	11.7
	Metal powders:				
339916	Tungsten carbide mil lb..	(S)	107.5	11.0	134.2
339919	All other do..	(S)	17.3		
190023	Iron and steel scrap, excluding home scrap 1,000 s tons..	(S)	.1	(Z)	(Z)
	Castings (rough and semifinished):				
332011	Iron (gray and malleable):				
	Purchased do..	(S)	10.8	10.2	8.9
	Produced and consumed do..	(Z)	(X)	(S)	(X)
332045	Steel:				
	Purchased do..	(S)	4.0	(S)	1.6
	Produced and consumed do..	(D)	(X)	(S)	(X)
336100	Aluminum and aluminum-base alloy:				
	Purchased mil lb..	*1.4	2.3	.6	1.5
	Produced and consumed do..	(Z)	(X)	(S)	(X)
336200	Copper and copper-base alloy:				
	Purchased do..	(S)	.2	(S)	.4
	Produced and consumed do..	-	(X)	(S)	(X)
336902	Other nonferrous:				
	Purchased do..	(S)	.5	(X)	(12)
	Produced and consumed do..	(Z)	(X)	(X)	(X)
346200	Iron and steel forgings:				
	Purchased 1,000 s tons..	(S)	1.6	(S)	2.2
	Produced and consumed do..	-	(X)	(S)	(X)
	Electric motors and generators:				
	Fractional horsepower electric motors (less than 1 hp):				
362110	Timing motors, synchronous and subsynchronous:				
	Purchased thousands..	(S)	1.0	(Z)	(Z)
	Produced and consumed do..	(D)	(X)	(S)	(X)
362115	Other fractional horsepower electric motors (less than 1 hp):				
	Purchased do..	(S)	1.5	*14.6	1.0
	Produced and consumed do..	-	(X)	(S)	(X)

See footnotes at end of table.

Table 7. Materials Consumed by Kind: 1982 and 1977—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 material code	Material	1982		1977	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
	INDUSTRY 3545, MACHINE TOOL ACCESSORIES—Con.				
362120	Electric motors and generators—Con. Integral horsepower motors and generators (1 hp or more):				
	Purchased thousands..	(S)	1.3	**3.4	1.1
	Produced and consumed do..	(Z)	(X)	(S)	(X)
356218	Bearings:				
	Ball	(X)	2.6	(X)	1.4
356201	Roller	(X)	1.1	(X)	1.7
356601	Speed changers, drives, gears, and industrial high speed drives	(X)	1.4	(X)	.7
356011	Hydraulic and pneumatic equipment, including pumps and compressors	(X)	2.6	(X)	1.3
360101	Electric transmission, distribution, and control equipment	(X)	5.3	(X)	1.8
329101	Grinding wheels and other abrasive products, except industrial diamonds	(X)	19.2	(X)	13.9
345001	Bolts, nuts, screws, washers, rivets, and screw machine products	(X)	7.0	(X)	7.2
970099	All other materials and components, parts, containers, and supplies	(X)	177.2	(X)	¹⁵ 204.1
971000	Materials, parts, containers, and supplies, n.s.k. ²	(X)	194.4	(X)	123.1
	INDUSTRY 3546, POWER DRIVEN HAND TOOLS				
	Materials, parts, containers, and supplies	(X)	652.3	(X)	574.0
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes 1,000 s tons..	14.5	19.9	15.3	11.6
331012	Sheet and strip			*27.4	14.8
331013	Plates			(Z)	(Z)
331015	Structural shapes	(S)	33.9	(D)	⁽¹⁴⁾
331017	Wire and wire products			(D)	⁽¹⁴⁾
331019	All other carbon mill shapes and forms	1.4	.7	(S)	¹⁴ 6.2
	Alloy steel, except stainless:				
331021	Bars and bar shapes	(S)	9.1	**10.2	10.5
331029	All other alloy steel mill shapes and forms	(S)	5.8	.3	.6
335609	Nonferrous metal mill shapes and forms, except copper and aluminum	(S)	1.0	(D)	⁽¹⁵⁾
	Insulated wire and cable, except magnet wire:				
335792	Copper (quantity of copper content) mil lb..	(S)	6.8	(S)	4.9
335793	Aluminum (quantity of aluminum content)	(D)	⁽¹⁶⁾	(D)	⁽¹⁵⁾
335770	Magnet wire	*7.2	10.1	8.5	11.5
	Castings (rough and semifinished):				
332011	Iron (gray and malleable):				
	Purchased 1,000 s tons..	(S)	3.4	3.5	4.8
	Produced and consumed do..	-	(X)	(S)	(X)
332045	Steel:				
	Purchased	(S)	6.0	**1.9	3.3
	Produced and consumed do..	-	(X)	(S)	(X)
336100	Aluminum and aluminum-base alloy:				
	Purchased mil lb..	(S)	39.9	**25.6	36.5
	Produced and consumed do..	(D)	(X)	(S)	(X)
336200	Copper and copper-base alloy:				
	Purchased	(D)	⁽¹⁶⁾	(X)	⁽¹⁵⁾
	Produced and consumed do..	(Z)	(X)	(X)	(X)
336902	Other nonferrous:				
	Purchased	(S)	9.5	(X)	⁽¹⁵⁾
	Produced and consumed do..	(D)	(X)	(X)	(X)
346200	Iron and steel forgings:				
	Purchased 1,000 s tons..	**3.4	4.0	10.7	9.2
	Produced and consumed do..	-	(X)	(S)	(X)
	Electric motors and generators:				
362110	Fractional horsepower electric motors (less than 1 hp):				
	Timing motors, synchronous and subsynchronous:				
	Purchased thousands..	(D)	⁽¹⁶⁾	(D)	⁽¹⁵⁾
	Produced and consumed do..	-	(X)	(S)	(X)
362115	Other fractional horsepower electric motors:				
	Purchased	5 089.7	7.0	(S)	8.5
	Produced and consumed do..	(D)	(X)	(S)	(X)
362120	Integral horsepower motors and generators (1hp or more):				
	Purchased	(D)	⁽¹⁶⁾	(S)	3.1
	Produced and consumed do..	(D)	(X)	(S)	(X)
356218	Bearings:				
	Ball	(X)	19.0	(X)	15.7
356201	Roller	(X)	3.6	(X)	4.3
356601	Speed changers, drives, gears, and industrial high speed drives	(X)	10.2	(X)	1.9
356011	Hydraulic and pneumatic equipment, including pumps and compressors	(X)	1.8	(X)	⁽¹⁵⁾
360101	Electric transmission, distribution, and control equipment	(X)	⁽¹⁶⁾	(X)	⁽¹⁵⁾
307902	Fabricated plastics products (except gaskets)	(X)	35.4	(X)	⁽¹⁵⁾
345001	Bolts, nuts, screws, fasteners, rivets, and screw machine products	(X)	18.6	(X)	8.5
970099	All other materials and components, parts, containers, and supplies	(X)	¹⁶ 348.2	(X)	¹⁵ 343.1
971000	Materials, parts, containers, and supplies, n.s.k. ²	(X)	58.4	(X)	75.0

See footnotes at end of table.

Table 7. **Materials Consumed by Kind: 1982 and 1977—Con.**

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 material code	Material	1982		1977	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
	INDUSTRY 3547, ROLLING MILL MACHINERY				
	Materials, parts, containers, and supplies -----	(X)	187.3	(X)	138.0
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ----- 1,000 s tons..	**4.9	2.0	8.2	3.8
331012	Sheet and strip ----- do..	*.5	.2	2.5	1.2
331013	Plates ----- do..	22.0	10.2	26.4	9.6
331015	Structural shapes ----- do..	4.5	2.3	*2.8	1.6
331017	Wire and wire products ----- do..	-	-	-	-
331019	All other carbon steel mill shapes and forms ----- do..	.7	.5	(S)	1.7
	Alloy steel, except stainless:				
331021	Bars and bar shapes ----- do..	-	-	(S)	2.8
331029	All other alloy steel mill shapes and forms ----- do..	(S)	5.6	*.2	.2
	Stainless steel:				
331033	Sheet and strip ----- do..	-	-	(S)	.2
331050	All other stainless steel mill shapes and forms ----- do..	(Z)	(Z)	(S)	.2
	Insulated wire and cable, except magnet wire:				
335792	Copper (quantity of copper content) ----- mil lb..	(Z)	(Z)	(D)	(¹⁷)
335793	Aluminum (quantity of aluminum content) ----- do..	-	-	(X)	(¹⁸)
335770	Magnet wire ----- do..	-	-	(X)	(¹⁸)
	Copper and copper-base alloy:				
335728	Bare wire for electrical conduction ----- do..	-	-	-	-
335102	Rod, bar, and mechanical wire, including extruded and/or drawn shapes ----- do..	(D)	(D)	(D)	(¹⁷)
335143	Plate, sheet, and strip, including military cups and discs ----- do..	(Z)	.2	(S)	17.6
335152	Pipe and tube ----- do..	(D)	(D)	-	-
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ----- do..	(Z)	(Z)	(S)	.1
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. ----- do..	-	-	(Z)	.1
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) ----- do..	-	-	-	-
335609	Nonferrous metal mill shapes and forms, except copper and aluminum ----- do..	-	-	-	-
329903	Industrial diamonds ----- carats..	-	-	-	-
329101	Grinding wheels and other abrasive products, except industrial diamonds ----- do..	(X)	.5	(X)	.5
	Metal powders:				
339916	Tungsten carbide ----- mil lb..	(Z)	(Z)	-	-
339919	All other ----- do..	-	-	-	-
190023	Iron and steel scrap, excluding home scrap ----- 1,000 s tons..	(D)	(D)	(¹⁸)	(¹⁸)
	Castings (rough and semifinished):				
332011	Iron (gray and malleable):				
	Purchased ----- do..	*2.7	2.9	2.0	2.6
	Produced and consumed ----- do..	-	(X)	(S)	(X)
332045	Steel:				
	Purchased ----- do..	*3.3	4.9	*3.7	5.6
	Produced and consumed ----- do..	-	(X)	(S)	(X)
336100	Aluminum and aluminum-base alloy:				
	Purchased ----- mil lb..	(Z)	(Z)	(¹⁹)	(¹⁹)
	Produced and consumed ----- do..	-	(X)	(S)	(X)
336200	Copper and copper-base alloy:				
	Purchased ----- do..	(S)	(²⁰)	19.4	191.4
	Produced and consumed ----- do..	-	(X)	(S)	(X)
336902	Other nonferrous:				
	Purchased ----- do..	-	-	(X)	(¹⁸)
	Produced and consumed ----- do..	-	(X)	(X)	(X)
346200	Iron and steel forgings:				
	Purchased ----- 1,000 s tons..	14.8	15.8	16.0	13.7
	Produced and consumed ----- do..	-	(X)	(S)	(X)
349421	Fluid power (hydraulic and pneumatic) valves ----- do..	(X)	1.1	(X)	(¹⁸)
349461	Fluid power (hydraulic and pneumatic) hose or tube fittings and assemblies ----- do..	(X)	(D)	(X)	(¹⁸)
	Engines:				
351920	Diesel and semidiesel:				
	Purchased ----- thousands..	-	-	(X)	(¹⁸)
	Produced and consumed ----- do..	-	(X)	(X)	(X)
351901	Gasoline and other carburetor:				
	Purchased ----- do..	-	-	(X)	(¹⁸)
	Produced and consumed ----- do..	-	(X)	(X)	(X)
	Electric motors and generators:				
362110	Fractional horsepower electric motors (less than 1 hp):				
	Timing motors, synchronous and subsynchronous:				
	Purchased ----- do..	(D)	(D)	-	-
	Produced and consumed ----- do..	-	(X)	(S)	(X)
362115	Other fractional horsepower electric motors:				
	Purchased ----- do..	-	-	(²¹)	(²¹)
	Produced and consumed ----- do..	-	(X)	(S)	(X)
362120	Integral horsepower motors and generators (1 hp or more):				
	Purchased ----- do..	(S)	4.1	²¹ 2.1	²¹ 2.1
	Produced and consumed ----- do..	-	(X)	(S)	(X)
	Bearings:				
356218	Ball ----- do..	(X)	2.9	(X)	.7
356201	Roller ----- do..	(X)	9.3	(X)	4.9
356601	Speed changers, drives, gears, and industrial high speed drives ----- do..	(X)	17.0	(X)	4.8
	Pumps (complete assemblies):				
356120	Hydraulic fluid power pumps, motors, and hydrostatic transmissions ----- thousands..	(S)	3.5	(⁵)	(⁵)
356102	Other pumps ----- do..	(S)	1.1	(X)	(¹⁸)
356301	Air and gas compressors ----- do..	(D)	(D)	(X)	(¹⁸)
356921	Filters for hydraulic fluid power systems ----- do..	(X)	.1	(X)	(⁵)
359921	Fluid power (hydraulic and pneumatic) cylinders and rotary actuators ----- do..	(X)	1.7	(X)	(⁵)
359922	Hydraulic and pneumatic equipment (except pumps, compressors, and rotary actuators) ----- do..	(X)	(D)	(X)	⁵¹ 1.8
360101	Electric transmission, distribution, and control equipment ----- do..	(X)	3.6	(X)	4.3
265001	Paperboard containers, boxes, and corrugated paperboard -- 1,000 s tons..	(Z)	(Z)	(X)	(¹⁸)

See footnotes at end of table.

Table 7. Materials Consumed by Kind: 1982 and 1977—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 material code	Material	1982		1977	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
	INDUSTRY 3547, ROLLING MILL MACHINERY— Con.				
280001	Industrial chemicals -----	(X)	.7	(X)	(¹⁸)
304101	Rubber and plastics hose and belting -----	(X)	.1	(X)	(¹⁸)
306902	Fabricated rubber products (except tires, tubes, hose, belting, and gaskets) -----	(X)	(D)	(X)	(¹⁸)
329300	Gaskets (all types) and asbestos packing -----	(X)	.3	(X)	(¹⁸)
345001	Bolts, nuts, screws, washers, rivets, and screw machine products -----	(X)	1.0	(X)	1.5
354501	Cutting tools for machine tools -----	(X)	1.9	(X)	2.5
362001	Electrical industrial capacitors, resistors, rheostats, and coil windings -----	(X)	(D)	(X)	(¹⁸)
362203	Numerical controls for metalworking machinery (except programmable) -----	(X)	(D)	(X)	.1
362204	Programmable controllers for metalworking machinery -----	(X)	(D)		
970099	All other materials and components, parts, containers, and supplies -----	(X)	²⁰ 50.6	(X)	¹⁸ 54.0
971000	Materials, parts, containers, and supplies, n.s.k. ² -----	(X)	34.6	(X)	15.4
	INDUSTRY 3549, METALWORKING MACHINERY, N.E.C.				
	Materials, parts, containers, and supplies -----	(X)	494.5	(X)	329.8
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ----- 1,000 s tons	(S)	9.8	(S)	11.2
331012	Sheet and strip ----- do.	^{**} 19.2	10.9	^{**} 15.4	6.3
331013	Plates ----- do.	(S)	9.6	(S)	4.8
331015	Structural shapes ----- do.	(S)	2.1	(S)	3.7
331017	Wire and wire products ----- do.	(S)	2.3	4.7	1.5
331019	All other carbon steel mill shapes and forms ----- do.	(S)	1.6	(S)	2.5
	Alloy steel, except stainless:				
331021	Bars and bar shapes ----- do.	(S)	3.8	^{**} 1.6	2.3
331029	All other alloy steel mill shapes and forms ----- do.	(S)	3.7	(S)	1.1
	Stainless steel:				
331033	Sheet and strip ----- do.	(S)	.4	^{**} .1	.4
331050	All other stainless steel mill shapes and forms ----- do.	(S)	1.0	.9	3.2
	Insulated wire and cable, except magnet wire:				
335792	Copper (quantity of copper content) ----- mil lb.	(S)	.3	(⁶)	(⁶)
335793	Aluminum (quantity of aluminum content) ----- do.	(Z)	(Z)	(X)	(²²)
335770	Magnet wire ----- do.	(Z)	(Z)	(X)	(²²)
	Copper and copper-base alloy:				
335728	Bare wire for electrical conduction ----- do.	(S)	.4	(S)	⁶ 1.2
335102	Rod, bar, and mechanical wire, including extruded and/or drawn shapes ----- do.	12.6	12.2	[*] 11.1	10.0
335143	Plate, sheet, and strip, including military cups and discs ----- do.	.2	.6	.2	.2
335152	Pipe and tube ----- do.			[*] .8	1.2
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ----- do.	(S)	.8	[*] .2	.6
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. ----- do.	(S)	2.0	[*] 1.1	1.6
335008	All other aluminum mill shapes and form (wire, rolled rod and bar, powder, welded tubing, etc.) ----- do.	(Z)	(Z)	[*] .5	.6
335609	Nonferrous metal mill shapes and forms, except copper and aluminum ----- do.	(S)	.3	(²²)	(²²)
329903	Industrial diamonds ----- carats				
329101	Grinding wheels and other abrasive products, except industrial diamonds -----	(X)	.9	(X)	.7
	Metal powders:				
339916	Tungsten carbide ----- mil lb.	-	-	(²²)	(²²)
339919	All other ----- do.	(D)	(²³)	(²²)	(²²)
190023	Iron and steel scrap, excluding home scrap ----- 1,000 s tons	(D)	(²³)	(²²)	(²⁸)
	Castings (rough and semifinished):				
332011	Iron (gray and malleable):				
	Purchased ----- do.	(S)	5.5	(S)	5.9
	Produced and consumed ----- do.	(Z)	(X)	(S)	(X)
332045	Steel:				
	Purchased ----- do.	(S)	6.1	.4	.8
	Produced and consumed ----- do.	(D)	(X)	(S)	(X)
336100	Aluminum and aluminum-base alloy:				
	Purchased ----- mil lb.	(S)	6.7	(S)	4.4
	Produced and consumed ----- do.	-	(X)	(S)	(X)
336200	Copper and copper-base alloy:				
	Purchased ----- do.	(S)	1.4	[*] 2.4	4.2
	Produced and consumed ----- do.	-	(X)	(S)	(X)
336902	Other nonferrous:				
	Purchased ----- do.	^{**} .6	.6	(X)	(²²)
	Produced and consumed ----- do.	(D)	(X)	(X)	(X)
346200	Iron and steel forgings:				
	Purchased ----- 1,000 s tons	(S)	1.4	.4	.5
	Produced and consumed ----- do.	(Z)	(X)	(S)	(X)
349421	Fluid power (hydraulic and pneumatic) valves -----	(X)	3.3	(X)	(²²)
349461	Fluid power (hydraulic and pneumatic) hose or tube fittings and assemblies -----	(X)	1.7	(X)	(²²)
	Engines:				
351920	Diesel and semidiesel:				
	Purchased ----- thousands	(D)	(²³)	(X)	(²²)
	Produced and consumed ----- do.	-	(X)	(X)	(X)
351901	Gasoline and other carburetor:				
	Purchased ----- do.	-	-	(X)	(²²)
	Produced and consumed ----- do.	-	(X)	(X)	(X)

See footnotes at end of table.

Table 7. **Materials Consumed by Kind: 1982 and 1977—Con.**

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 material code	Material	1982		1977	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
	INDUSTRY 3549, METALWORKING MACHINERY, N.E.C.—Con.				
	Electric motors and generators:				
	Fractional horsepower electric motors (less than 1 hp):				
362110	Timing motors, synchronous and subsynchronous:				
	Purchased thousands...	(S)	1.0	(S)	.6
	Produced and consumed do..	-	(X)	(S)	(X)
362115	Other fractional horsepower electric motors:				
	Purchased do..	(S)	2.2	(X)	3.6
	Produced and consumed do..	-	(X)	(S)	(X)
362120	Integral horsepower motors and generators (1 hp or more):				
	Purchased do..	(S)	10.7	**36.5	5.8
	Produced and consumed do..	(D)	(X)	(S)	(X)
	Bearings:				
356218	Ball	(X)	2.8	(X)	1.4
356201	Roller	(X)	1.9	(X)	1.4
356601	Speed changers, drives, gears, and industrial high speed drives	(X)	5.7	(X)	4.1
	Pumps (complete assemblies):				
356120	Hydraulic fluid power pumps, motors, and hydrostatic transmissions thousands...	(S)	3.6	(S)	(⁵)
356102	Other pumps do..	(S)	.2	(X)	(²²)
356301	Air and gas compressors do..	(S)	(²³)	(X)	(²²)
356921	Filters for hydraulic fluid power systems do..	(X)	.3	(X)	(⁵)
359921	Fluid power (hydraulic and pneumatic) cylinders and rotary actuators	(X)	2.3	(X)	(⁵)
359922	Hydraulic and pneumatic equipment (except pumps, compressors, cylinders, and rotary actuators)	(X)	3.3	(X)	⁵ 10.1
360101	Electric transmission, distribution, and control equipment	(X)	16.7	(X)	9.4
265001	Paperboard containers, boxes, and corrugated paperboard ... 1,000 s tons...	(S)	3.5	(X)	(²²)
280001	Industrial chemicals	(X)	.4	(X)	(²²)
304101	Rubber and plastics hose and belting	(X)	1.6	(X)	(²²)
306902	Fabricated rubber products (except tire, tubes, hose, belting, and gaskets)	(X)	.8	(X)	(²²)
329300	Gaskets (all types) and asbestos packing	(X)	.3	(X)	(²²)
345001	Bolts, nuts, screws, washers, rivets, and screw machine products	(X)	5.5	(X)	3.2
354501	Cutting tools for machine tools	(X)	2.2	(X)	2.4
362001	Electrical industrial capacitors, resistors, rheostats, and coil windings	(X)	2.4	(X)	(²²)
362203	Numerical controls for metalworking machinery (except programmable)	(X)	1.2	(X)	1.0
362204	Programmable controllers for metalworking machinery	(X)	1.9		
970099	All other materials and components, parts, containers, and supplies	(X)	²³ 155.3	(X)	²² 135.2
971000	Materials, parts, containers, and supplies, n.s.k. ²	(X)	179.3	(X)	82.7

¹For some establishments, data have been estimated from central unit values which are based on quantity-cost relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: * 10 to 19 percent estimated; ** 20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by (S).

²Total cost of materials of establishments that did not report detailed materials data, including establishments that were not mailed a form.

³For 1982, material codes 335793, 335770, 336902, 351920, and 280001 are included with material code 970099 to avoid disclosing data for individual companies.

⁴For 1977, delivered costs for material codes 335793, 335770, 335609, 336902, 349421, 349461, 351920, 351901, 356102, 356301, 265001, 280001, 304101, 306902, 329300, and 362001 were included with material code 970099.

⁵For 1977, material codes 356120, 356921, and 359921 were included with material code 359922.

⁶For 1977, material code 335792 was included with material code 335728 to avoid disclosing data for individual companies.

⁷For 1982, material codes 335793, 335609, 339916, 351901, and 356301 are included with material code 970099 to avoid disclosing data for individual companies.

⁸For 1977, delivered costs for material codes 335793, 335770, 336902, 349421, 349461, 351920, 351901, 356102, 356301, 265001, 280001, 304101, 306902, 329300, and 362001 were included with material code 970099.

⁹For 1982, material code 335728 is combined with material code 335143 to avoid disclosing data for individual companies.

¹⁰For 1977, material code 335301 was included with material code 335405 to avoid disclosing data for individual companies.

¹¹For 1977, material code 335008 was included with material code 335609 to avoid disclosing data for individual companies.

¹²For 1977, delivered cost for material code 336902 was included with material code 970099.

¹³For 1977, material codes 335792 and 335793 were included with material code 335770 to avoid disclosing data for individual companies.

¹⁴For 1977, material codes 331015 and 331017 were included with material code 331019 to avoid disclosing data for individual companies.

¹⁵For 1977, material codes 335609, 335793, 362110, 356011, and 360101 were included with material code 970099 to avoid disclosing data for individual companies. For 1977, delivered costs for material codes 336200, 336902, and 307902 were included with material code 970099.

¹⁶For 1982, material codes 335793, 336200, 362110, 362120, and 360101 are included with material code 970099 to avoid disclosing data for individual companies.

¹⁷For 1977, material codes 335792 and 335102 were included with material code 335143 to avoid disclosing data for individual companies.

¹⁸For 1977, delivered costs for material codes 335793, 335770, 336902, 349421, 349461, 351920, 351901, 356102, 356301, 265001, 280001, 304101, 306902, 329300, and 362001 were included with material code 970099. For 1977, material code 190023 was included with material code 970099 to avoid disclosing data for individual companies.

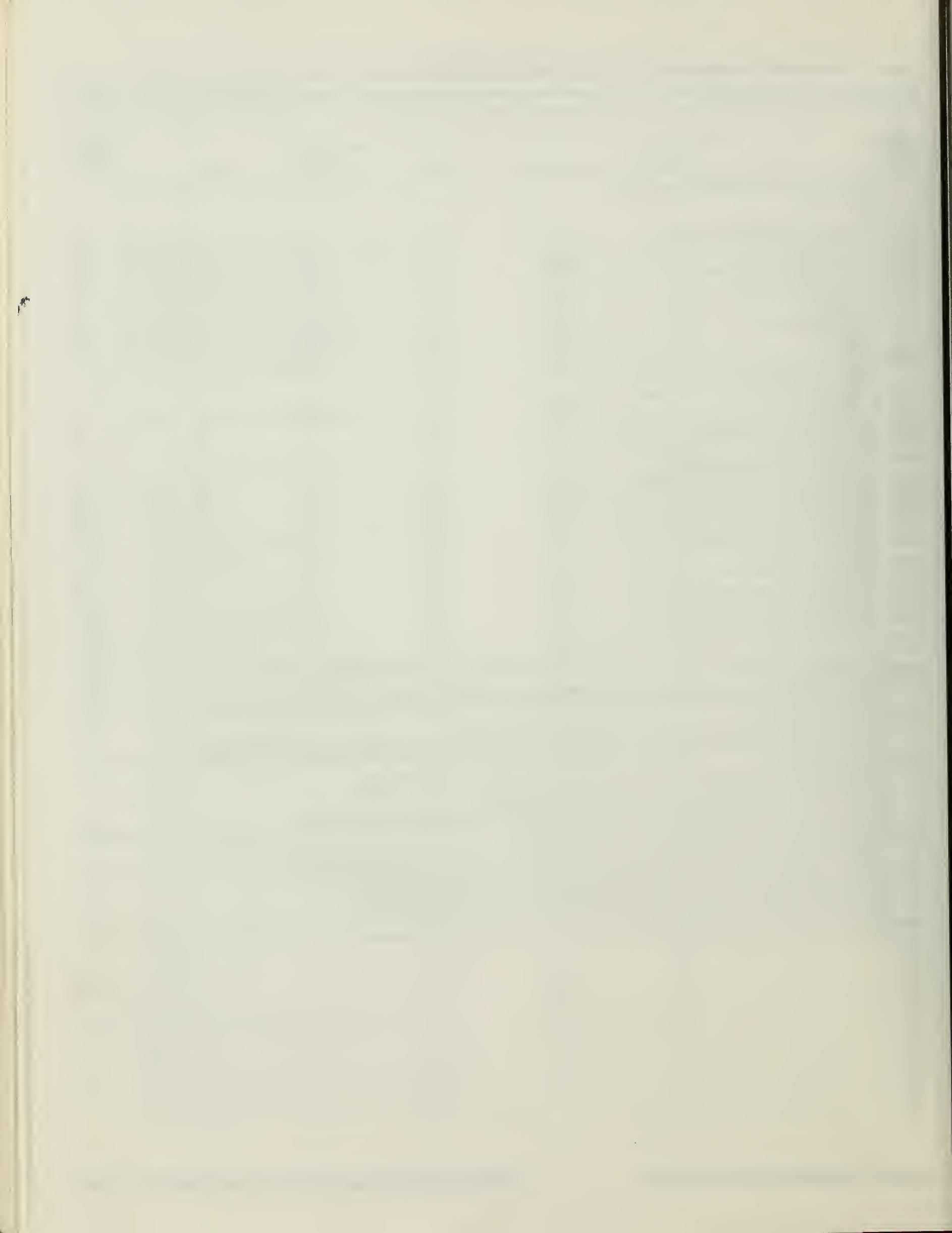
¹⁹For 1982 and 1977, material code 336100 was included with material code 336200 to avoid disclosing data for individual companies.

²⁰For 1982, material code 336200 was included with material code 970099 to avoid disclosing data for individual companies.

²¹For 1977, material code 362115 was included with material code 362120 to avoid disclosing data for individual companies.

²²For 1977, delivered costs for material codes 335793, 335770, 335609, 339916, 339919, 190023, 336902, 349421, 349461, 351920, 351901, 356102, 356301, 265001, 280001, 304101, 306902, 329300, and 362001 were included with material code 970099.

²³For 1982, material codes 339919, 190023, 351920, and 356301 were included with material code 970099 to avoid disclosing data for individual companies.



APPENDIX A.

Explanation of Terms

This appendix is in two sections. Section 1 includes items which were requested of all establishments that were mailed census of manufactures forms including annual survey of manufactures (ASM) forms. Note that this section also includes several items (number of establishments and companies, value added, classes of products, and specialization and coverage ratios) that were not included on the report forms but were derived from information collected on the forms. Section 2 covers supplementary items that were requested only from establishments included in the ASM sample. Results of the supplementary ASM inquiries are included in tables 3c and 3d of this report.

SECTION 1. ITEMS COLLECTED OR DERIVED BASED ON ALL CENSUS OF MANUFACTURES (INCLUDING ASM) REPORT FORMS

Number of establishments and companies—As discussed in the Introduction, a separate report was required for each manufacturing establishment (plant) with one employee or more. An establishment is defined as a single physical location where manufacturing is performed. A company, on the other hand, is defined as a business organization consisting of one establishment or more under common ownership or control.

If the company operates at different physical locations, even if the individual locations are producing the same line of goods, a separate report was requested for each location. If the company operates in two or more distinct lines of manufacturing at the same location, a separate report was requested for each activity.

An establishment not in operation for any portion of the year was requested to return the report form with the proper notation in the "Operational Status" section of the form. In addition, the establishment was requested to report data on the number of custodial employees, capital expenditures, inventories, or any shipments from inventories during the portion of the year the plant was in operation.

In this report, data are shown for establishments in operation at any time during the year. A comparison with the number of establishments in operation at the end of the year will be provided in the Introduction to Part 1 of the General Summary subject report.

Employment and related items—The regular report forms requested separate information on production workers as of a payroll period for each quarter of the year and on other employees as of the payroll period which included the 12th of March.

All employees—This item includes all full-time and part-time employees on the payrolls of operating manufacturing establishments during any part of the pay period ending nearest the 12th of the months specified on the report form. Included are all persons on paid sick leave, paid holidays, and paid vacations during these pay periods. Officers of corporations are included as employees; proprietors and partners of unincorporated firms are excluded. The "all employees" number is the average number of production workers plus the number of other employees in mid-March. The number of production workers is the average for the payroll periods including the 12th of March, May, August, and November.

Production workers—This item includes workers (up through the line-supervisor level) engaged in fabricating, processing, assembling, inspecting, receiving, storing, handling, packing, warehousing, shipping (but not delivering), maintenance, repair, janitorial and guard services, product development, auxiliary production for plant's own use (e.g., power plant), recordkeeping, and other services closely associated with these production operations at the establishment covered by the report. Employees above the working-supervisor level are excluded from this item.

All other employees—This item covers nonproduction employees of the manufacturing establishment including those engaged in factory supervision above the line-supervisor level. It includes sales (including driver salespersons), sales delivery (highway truck drivers and their helpers), advertising, credit, collection, installation and servicing of own products, clerical and routine office function, executive, purchasing, financing, legal, personnel (including cafeteria, medical, etc.), professional, and technical employees. Also included are employees on the payroll of the manufacturing establishment who are engaged in the construction of major additions or alterations to the plant and who are utilized as a separate work force.

In addition to reports sent to operating manufacturing establishments, information on employment during the payroll period which included March 12 and annual payrolls was also requested of auxiliary units (e.g., administrative offices, warehouses, and research and development laboratories) of multiestablishment companies. However, these figures are not included in the totals for individual industries shown in this report. They are included in the general summary and geographic area reports and in the final bound volumes as a separate category.

Payrolls—This item includes the gross earnings of all employees on the payroll of operating manufacturing establishments paid in the calendar year 1982. Respondents were told they could follow the definition of payrolls used for calculating the Federal withholding tax. It includes all forms of compensation, such as salaries, wages, commissions, dismissal pay, all bonuses, vacation and sick leave pay, and compensation in kind, prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. The total includes salaries of officers

of corporations, but excludes payments to proprietors or partners of unincorporated concerns. Also excluded are payments to members of Armed Forces and pensioners carried on the active payroll of manufacturing establishments.

The census definition of payrolls is identical to that recommended to all Federal statistical agencies by the Office of Management and Budget. It should be noted that this definition does not include employers' Social Security contributions or other nonpayroll labor costs, such as employees' pension plans, group insurance premiums, and workers' compensation.

The ASM provides estimates of employers' supplemental labor costs, both those required by Federal and State laws and those incurred voluntarily or as part of collective bargaining agreements. (Supplemental labor costs are explained later in this appendix.)

As in the case of employment figures, the payrolls of separate auxiliary units of multiestablishment companies are not included in the totals for individual industries or industry groups.

Production-worker hours—This item covers hours worked or paid for at the plant, including actual overtime hours (not straight-time equivalent hours). It excludes hours paid for vacations, holidays, or sick leave.

Cost of materials—This term refers to direct charges actually paid or payable for items consumed or put into production during the year, including freight charges and other direct charges incurred by the establishment in acquiring these materials. It includes the cost of materials or fuel consumed, whether purchased by the individual establishment from other companies, transferred to it from other establishments of the same company, or withdrawn from inventory during the year.

The important components of this cost item are (1) all raw materials, semifinished goods, parts, components, containers, scrap, and supplies put into production or used as operating supplies and for repair and maintenance during the year, (2) electric energy purchased, (3) fuels consumed for heat, power, or the generation of electricity, (4) work done by others on materials or parts furnished by manufacturing establishments (contract work), and (5) products bought and resold in the same condition. (See discussion of duplication of data below.)

Specific materials consumed—In addition to the total cost of materials, which every establishment was required to report, information was also collected for most manufacturing industries on the consumption of major materials used in manufacturing. The inquiries were restricted to those materials which were important parts of the cost of production in a particular industry and for which cost information was available from manufacturers' records. Information on the specific materials consumed is shown in table 7 if appropriate to the industry. Establishments consuming less than a specified amount (usually \$10,000) of a specific material were not requested to report consumption of that material separately. Also, the cost of materials for the small establishments for which either administrative records or short forms were used was imputed as "not specified by kind." (See the Introduction for the importance of administrative records in the industry.)

Value of shipments—This item covers the received or receivable net selling values, f.o.b. plant (exclusive of freight and taxes), of all products shipped, both primary and secondary, as well as all miscellaneous receipts, such as receipts for contract work performed for others, installation and repair, sales of scrap, and sales of products bought and resold without further

processing. Included are all items made by or for the establishments from materials owned by it, whether sold, transferred to other plants of the same company, or shipped on consignment. The net selling value of products made in one plant on a contract basis from materials owned by another was reported by the plant providing the materials.

In the case of multiunit companies, the manufacturer was requested to report the value of products transferred to other establishments of the same company at full economic or commercial value, including not only the direct cost of production but also a reasonable proportion of "all other costs" (including company overhead) and profit. (See discussion of duplication of data below.)

Individual products—As in previous censuses, data were collected for almost all industries on the quantity and value of individual products shipped. In the 1982 census program, information was collected on the output of approximately 11,000 individual product items. The term "product," as used in the census of manufactures, represents the finest level of detail for which output information was requested. Consequently, it is not necessarily synonymous with the term "product" as used in the marketing sense. In some cases it may be much more detailed and, in other cases, it is more aggregative. For example, "pharmaceutical preparations" was distributed into over 100 items; whereas, "motor gasoline" was reported as a single item.

Approximately 6,000 of the product items were listed separately on the 1982 census report forms. Data for about 5,000 products were obtained in the monthly, quarterly, or annual surveys comprising the Current Industrial Reports series of the Census Bureau. Totals for the year 1982 for these items, as derived from the commodity surveys, are shown in the "products shipped" table (table 6a) together with the tieline total value collected in the census for reconciliation purposes.

The list of products for which separate information was collected was prepared after consultation with industry and government representatives. Comparability with previous figures was given considerable weight in the selection of product categories so that comparable 1977 information is presented for most products.

Typically, both quantity and value of shipments information was collected. However, if quantity was not significant or could not be reported by manufacturers, only value of shipments was collected.

Shipments include both commercial shipments and transfers of products to other plants of the same company. For industries in which a considerable portion of the total shipments is transferred to other plants of the same company, separate information on interplant transfers was also collected. Moreover, for products that are used to a large degree within the same establishment as materials or components in the fabrication of other products, total production and often consumption of the item within the plant was collected. Typically, the information on production was also collected for products for which there are significant differences between total production and shipments in a given year because of wide fluctuations in finished goods inventories. Other measures of output of products with long production cycles were used as appropriate and feasible.

Classes of products—To summarize the product information, the separate products were aggregated into classes of products that, in turn, were grouped into all primary products of each industry. The code structure used is a seven-digit number for the

individual product, a five-digit number for the class of product, and a four-digit number for the total primary products in an industry. (See Introduction, Industry Classification of Establishments, for application of the coding structure to the assignment of SIC codes for establishments.)

In the 1982 census, the 11,000 products were grouped into approximately 1,500 separate classes on the basis of general similarity of manufacturing processes, types of materials used, and the like. However, the grouping of products was affected by the economic significance of the class and, in some cases, dissimilar products were grouped because the products were not sufficiently significant to warrant separate classes.

Duplication in cost of materials and value of shipments—The aggregate of the cost of materials and value of shipments figures for industry groups and for all manufacturing industries includes large amounts of duplication, since the products of some industries are used as materials by others. With some important exceptions, such as for motor vehicles and parts, this duplication is not significant at the four-digit industry level. However, it is significant at the two-digit and three-digit industry group level because these totals often include industries that represent successive stages in the production of a finished manufactured product. Examples are the addition of flour mills to bakeries in the "Food" group and the addition of pulp mills to paper mills in the "Paper and Allied Products" group of industries. Estimates of the overall extent of this duplication indicate that the value of manufactured products exclusive of such duplication (the value of finished manufactures) tends to approximate two-thirds of the total value of products reported in the census of manufactures.

Value added by manufacture—This measure of manufacturing activity is derived by subtracting the cost of materials, supplies, containers, fuel, purchased electricity, and contract work from the value of shipments (products manufactured plus receipts for services rendered). The result of this calculation is adjusted by the addition of value added by merchandising operations (i.e., the difference between the sales value and the cost of merchandise sold without further manufacture, processing, or assembly) plus the net change in finished goods and work-in-process between the beginning- and end-of-year inventories.

Because of the change in instructions for reporting inventories for 1982, the 1982 figure for value added is not strictly comparable to prior-year data. This is explained more fully in the inventories section below.

"Value added" avoids the duplication in the figure for value of shipments that results from the use of products of some establishments as materials by others. Value added is considered to be the best value measure available for comparing the relative economic importance of manufacturing among industries and geographic areas.

New and used capital expenditures—For establishments in operation and establishments under construction but not yet in operation, manufacturers were asked to report their new expenditures for (1) permanent additions and major alterations to manufacturing establishments, and (2) machinery and equipment used for replacement and additions to plant capacity if they were of the type for which depreciation accounts were ordinarily maintained.

The totals for new expenditures exclude that portion of expenditures leased from nonmanufacturing concerns, new facilities owned by the Federal Government but operated under

contract by private companies, and plant and equipment furnished to the manufacturer by communities and nonprofit organizations. Also excluded are expenditures for used plant and equipment (although reported in the census), expenditures for land, and cost of maintenance and repairs charged as current operating expenses.

Manufacturers were also requested to report the value of all used buildings and equipment purchased during the year at the purchase price. For any equipment or structure transferred to the use of the reporting establishment by the parent company or one of its subsidiaries, the value at which it was transferred to the establishment was to be reported. Furthermore, if the establishment changed ownership during the year, the cost of the fixed assets (building and equipment) was to be reported under used capital expenditures.

Total expenditures for used plant and equipment is a universe figure; i.e., it is collected on all census forms. However, the breakdown of this figure between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form and is subject to sampling error (see table 3d). The data for total new capital expenditures, new building expenditures, and new machinery expenditures, as well as the data for total used expenditures, are shown in both tables 3a and 3d. The figure in table 3a is a census universe total and may differ from the results of the ASM sample shown in table 3d. Since the figures in table 3d are subject to sampling error, they are not considered as reliable as the universe figures.

End-of-year inventories—Respondents were asked to report their 1981 and 1982 end-of-year inventories at cost or market. Effective with the 1982 Economic Censuses, this change to a uniform instruction for reporting inventories was introduced for all sector reports. Prior to 1982, respondents were permitted to value inventories using any generally accepted accounting method (FIFO, LIFO, market, to name a few). In 1982, LIFO users were asked to first report inventory values prior to the LIFO adjustment and then to report the LIFO reserve and the LIFO value after adjustment for the reserve.

Because of this change in reporting instructions, the 1982 data for inventories and value added by manufacture included in the tables of this report are not comparable to the prior-year data shown in table 1a of this report and in historical census of manufactures and annual survey of manufactures publications. Inventories and value added data estimated on a basis comparable to the historical data, using the reported information for 1982, are shown in footnote 4 of table 1a. However, the end-of-1981 figure shown in this footnote may differ from the corresponding value published as part of the 1981 Annual Survey of Manufactures.

This difference at the four-digit SIC level is due primarily to the effects of industry shifts. As described in the Industry Classification of Establishments section of the Introduction, ASM noncertainty plants are allowed to shift from one industry to another in a census year; whereas, they are "frozen" in a particular industry in ASM years. Other explanations for this difference include the effects of sampling and processing errors and revisions to end-of-1981 data reported by respondents.

In using inventory data by stage of fabrication for "all industries" and at the two-digit industry level, it should be noted that an item treated as a finished product by an establishment in one industry may be reported as a raw material by another establishment in a different industry. For example, the finished-product inventories of a steel mill would be reported as raw

materials by a stamping plant. Such differences are present in the inventory figures by stage of fabrication shown for individual industries, industry groups, and "all manufacturing," which are aggregates of figures reported by establishments in specified industries.

Specialization and coverage ratios—These items are not collected on the report forms but are derived from the data shown in table 5b. An establishment is classified in a particular industry if its shipments of primary products of that industry exceed in value its shipments of the products of any other single industry.

As noted in the Introduction, an establishment's shipments include those products assigned to an industry (primary products), those considered primary to other industries (secondary

products), and receipts for miscellaneous activities (merchandising, contract work, resales, etc.). Specialization and coverage ratios have been developed to measure the relationship of primary product shipments to the data on shipments for the industry shown in tables 1a through 5a and data on product shipments shown in tables 6a through 6c.

Specialization ratio represents the ratio of primary product shipments to total product shipments (primary and secondary, excluding miscellaneous receipts) for the establishments classified in the industry.

Coverage ratio represents the ratio of primary products shipped by the establishments classified in the industry to the total shipments of such products that are shipped by all manufacturing establishments wherever classified.

SECTION 2. ITEMS COLLECTED ONLY ON ASM REPORT FORMS

Supplemental labor costs—Supplemental labor costs are divided into legally required expenditures and payments for voluntary programs. The legally required portion consists primarily of Federal old age and survivors' insurance, unemployment compensation, and workers' compensation. Payments for voluntary programs include all programs not specifically required by legislation whether they were employer initiated or the result of collective bargaining. They include the employer portion of such plans as insurance premiums, premiums for supplemental accident and sickness insurance, pension plans, supplemental unemployment compensation, welfare plans, stock purchase plans on which the employer payment is not subject to withholding tax, and deferred profit-sharing plans. They exclude such items as company-operated cafeterias, in-plant medical services, free parking lots, discounts on employee purchases, and uniforms and work clothing for employees. While the excluded items do benefit employees and all or part of their cost generally is similar to the items covered in the ASM labor costs statistics, accounting records do not generally provide reliable figures on net employee benefits of these types.

Cost of purchased services—ASM establishments were requested to provide information on the cost of purchased services for the repair of buildings and other structures, the repair of machinery, and communication services. Included in the cost of purchased services for the repair of buildings and machinery are payments made for all maintenance and repair work on buildings and equipment, such as painting, roof repairs, replacing parts, and overhauling equipment. Such payments made to other establishments of the same company and for repair and maintenance of any leased property are also included. Extensive repairs or reconstruction that were capitalized are considered capital expenditures for used buildings and machinery and are, therefore, excluded from this item. Repair and maintenance costs provided by an owner as part of a rental contract or incurred directly by an establishment in using its own work force are also excluded.

The response coverage ratio shown in table 3d for each of the three types of purchased services listed above is a measure of the extent to which respondents reported for each item. It is derived for each item by calculating the ratio of the weighted employment (establishment data multiplied by sample weight; see section 3) for those ASM establishments that reported the

specific inquiry to the weighted total employment for all ASM establishments classified in the industry.

Electric energy used for heat and power—Data on the cost of purchased electric energy were collected on all census forms. However, data on the quantity of purchased electric energy and quantity of generated-less-sold electric energy were collected only on the ASM forms. The cost and quantity of purchased electric energy represent the amount actually used during the year for heat and power. In addition, information was collected on the quantity of electric energy generated by the establishment and the quantity of electric energy sold or transferred to other plants of the same company.

Beginning- and end-of-year depreciable assets—The data encompass all fixed depreciable assets on the books of establishments at the beginning and at the end of the year. The values shown (book value) represent the actual cost of assets at the time they were acquired, including all costs incurred in making the assets usable (such as transportation and installation). Included are all buildings, structures, machinery, and equipment (production, office, and transportation equipment) for which depreciation reserves are maintained. Excluded are non-depreciable capital assets, including inventories and intangible assets, such as patent rights and royalties. Also excluded are land and depletable assets, such as timber and mineral rights.

The definition of fixed depreciable assets is consistent with the definition of capital expenditures. For example, expenditures include actual capital outlays during the year, rather than the final value of equipment put in place and buildings completed during the year. Accordingly, the value of assets at the end of the year includes the value of construction in progress. In addition, respondents were requested to make certain that assets at the beginning of the year plus new and used capital expenditures, less retirements, equalled assets at the end of the year.

New and used capital expenditures—The data for total new capital expenditures, new building expenditures, new machinery expenditures, and total used capital expenditures are collected on all census forms. However, the breakdown between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form. (See further explanation on capital expenditures in section 1.)

Breakdown of new capital expenditures for machinery and equipment—ASM establishments were requested to separate their capital expenditures for new machinery and equipment into (1) automobiles, trucks, etc., for highway use, (2) computers and peripheral data processing equipment, and (3) all other.

The category "automobiles, trucks, etc., for highway use" is intended to measure expenditures for vehicles designed for highway use that were acquired through a purchase or lease-purchase agreement. Vehicles normally operating off public highways (vehicles specifically designed to transport materials, property, or equipment on mining, construction, logging, and petroleum development projects) are excluded from this item.

The "not specified by kind" or n.s.k. item for expenditures for new machinery and buildings, shown in table 3d, represents the total machinery and equipment expenditures for establishments that did not break down their expenditures for the three specific categories. This means that for most industries the specific categories are understated.

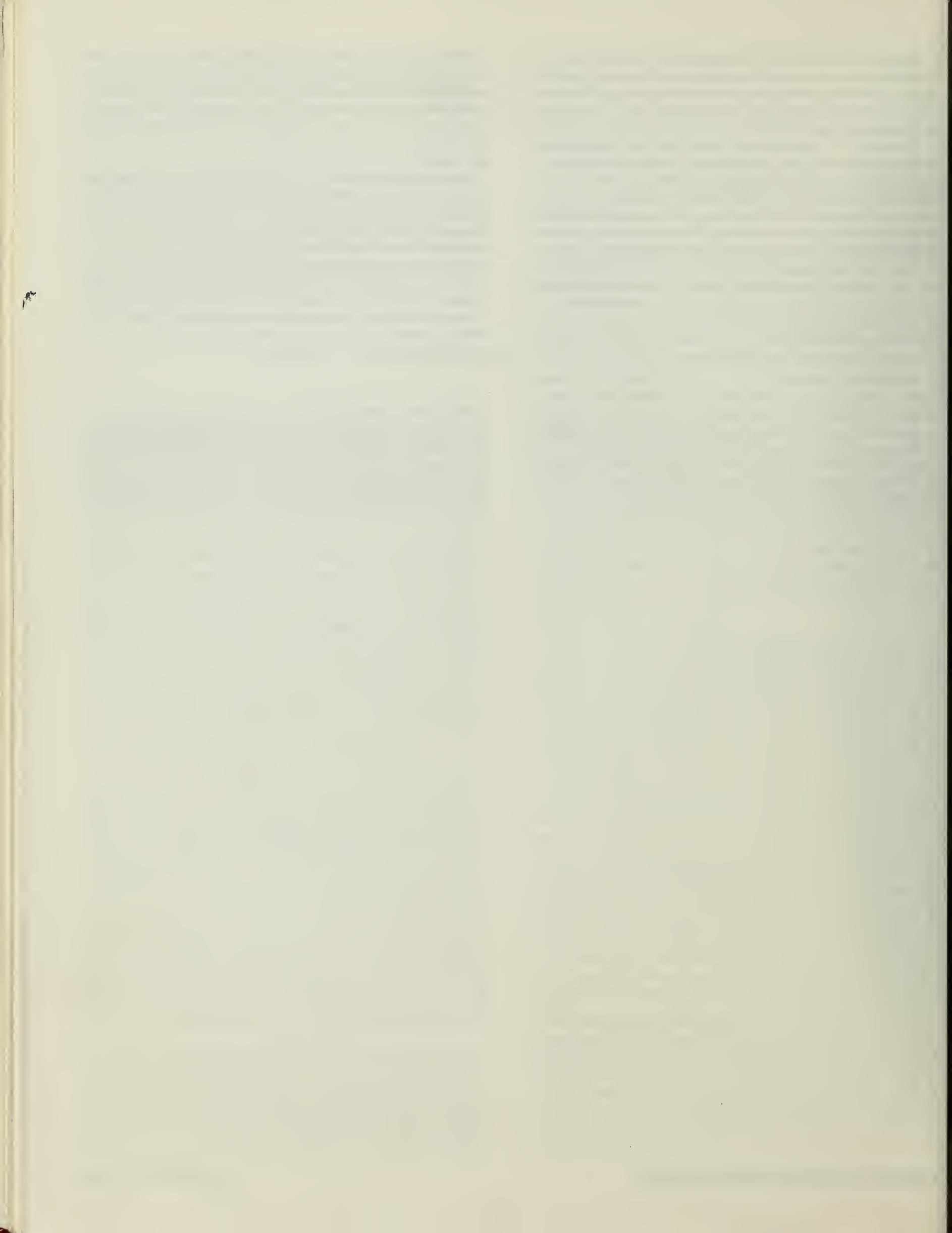
Retirements—Included in this item is the gross value of assets sold, retired, scrapped, destroyed, etc., during 1982. When a complete operation or establishment changed ownership, the respondent was instructed to report the value of the assets sold at the original cost as recorded in the books of the seller. The respondent was also requested to report retirements of equipment or structures owned by a parent company that the establishment was using as if it were a tenant.

Rental payments—This item includes rental payments for the use of all items for which depreciation reserves would be maintained if they were owned by the establishment, e.g., structures and buildings, and production, office, and transportation equipment. Excluded are royalties and other payments for the use of intangibles and depletable assets, and land rents where separable.

When an establishment of a multiestablishment company was charged rent by another part of the same company for the use of assets owned by the company, it was instructed to exclude that cost from rental payments. However, the book value (original cost) of these company-owned assets was to be reported as assets of the establishment at the end of the year.

If there were assets at an establishment rented from another company, and the rents were paid centrally by the head office of the establishment, the company was instructed to report these rental payments as if they were paid directly by the establishment.

Depreciation charges—This item includes depreciation and amortization charged during the year against assets. Depreciation charged against fixed assets acquired since the beginning of the year and against assets sold or retired during the year are components of this category. Respondents were requested to make certain that they did not report accumulated depreciation.



APPENDIX B.

Annual Survey of Manufactures (ASM) Sampling and Estimating Methodologies

DESCRIPTION OF SURVEY SAMPLE

The Annual Survey of Manufactures (ASM) contains two components. The mail portion of the survey is a probability sample of about 55,000 manufacturing establishments selected from a total of about 225,000 establishments. These 225,000 establishments represent all manufacturing establishments of multiunit companies and all single-unit manufacturing establishments with five employees or more tabulated in the 1977 Census of Manufactures. This mail portion is supplemented by a Social Security Administration list of new manufacturing establishments opened after 1977. The individual establishments were defined as the sampling unit for this sample. This is a change from the previous ASM sample when companies were used as the sampling unit. The implication of this change is that the probability of selection of any establishment relates only to the size of the establishment itself and is independent of the size of the company with which the establishment is affiliated. The efficiencies associated with the change to an establishment sample have made it possible to reduce the mail sample panel from 70,000 establishments in 1978 to 55,000 establishments in the current panel.

The nonmail portion of the survey includes all single-unit establishments that were tabulated with less than five employees in the 1977 Census of Manufactures. Although this portion contained approximately 125,000 establishments, it accounted for less than 2 percent of the estimate for total value of shipments at the total manufacturing level. This portion was not sampled; rather, the data for every establishment in this group were estimated based on selected information obtained annually from the administrative records of other Federal agencies. This administrative record information, which includes payroll, total employment, industry classification, and physical location of the establishment, was obtained under special conditions, which safeguard the confidentiality of both tax and census records. Estimates for data for these small establishments were developed using industry averages in conjunction with the administrative information.

The corresponding estimates for the mail and nonmail establishments were added together, along with the adjusted base-year differences as defined in Description of Estimating Procedures below. The remaining description of the survey sample relates only to the mail portion of the ASM sample.

All establishments with 250 employees or more in the 1977 census were included in the survey panel with certainty. These establishments collectively account for approximately 65 percent of the total value of shipments for manufacturing establishments in the 1977 census. Smaller establishments were sampled with probabilities ranging from 1.000 down to 0.005 in accordance with mathematical theory for optimum allocation of a sample.

The probabilities of selection assigned to the smaller establishments were proportional to measures of size determined for each establishment. For establishments included in the 1977 Census of Manufactures, the measure of size depended directly upon each establishment's 1977 product class values and the

historic variability of the year-to-year shipments of each product class. Roughly equivalent measures of size were assigned to postcensus birth establishments based on their industry codes and anticipated payroll and employment.

The method of assigning measures of size was used in order to maximize the precision (that is, minimize the variance of estimates of the year-to-year change) in the value of product class shipments. Implicitly, it also gave weight to differences in employment, value added, and other general statistics, for these are highly correlated with value of shipments. Individual sample selection probabilities were obtained by multiplying each establishment's final measure of size by an overall sampling fraction coefficient calculated to yield a total expected sample size.

The sample selection procedure gave each establishment in the sampling frame an independent chance of selection. This method of independent selection permits the rotation of establishments into and out of a given sample panel without introducing a bias into the survey estimates.

DESCRIPTION OF ESTIMATING PROCEDURES

Most of the ASM estimates for the years 1978-1981 were computed using a modified "difference estimate" formula. For each item, a base-year difference was developed. This base-year difference is equal to the difference between the 1977 census published number for an item total and the linear ASM estimate of the total for 1977. The ASM linear estimate was obtained by multiplying each sample establishment's data by its sample weight (the reciprocal of its probability of selection) and summing the weighted values.

This base-year difference was then adjusted to reflect the estimated growth at the four-digit or, in the case of product classes, five-digit based Standard Industrial Classification (SIC) level from 1977 to the year of the survey; for example, 1981. It should be noted that due to processing constraints, the growth factors lagged one year; i.e., if 1981 is the survey year, they were not based on the estimated growth from 1977 to 1981 but rather the growth from 1977 to 1980. This one-year lag had negligible effect on the estimates, particularly at the total manufacturing level where the adjusted base-year difference accounted for less than 1 percent of the estimate for total value of shipments.

These adjusted base-year differences were then added to the corresponding current-year linear estimates, which include the sum of the estimates for the mail and nonmail establishments, to produce the estimates for the years 1978-1981. Estimates developed by this procedure usually are far more reliable than comparable linear estimates developed from the current sample data alone.

The 1982 sample data included in table 3d were also developed using difference estimates. However, since the universe totals for the census year (1977 or 1982) were not known, a modification of the procedure described above was necessary. For each item in table 3d, except purchased services and breakdown of expenditures for new machinery and equipment (see further description in appendix A, section 2), linear

estimates of the publication totals from the ASM mail sample were adjusted by the difference between imputed census totals and the corresponding ASM mail sample estimates of these imputed totals. These imputed totals are obtained by applying industry average ratios to control item values at the establishment level. For example, an imputed total beginning assets figure is obtained by multiplying each establishment's total value of shipments by the industry (four-digit SIC) average for the ratio of beginning assets to shipments.

Separate estimates for the nonmail establishments were not developed. However, their contribution to the publication estimates is reflected in the difference adjustment.

The method of inventory valuation percentages included in table 3c was developed using both complete census information and ASM estimates. The percentages for the four major categories (LIFO, non-LIFO, valuation method not reported, and LIFO reported without associated value and reserve) were derived from the complete census and correspond to the values included in table 3d. The percentages for the specific non-LIFO methods of valuations (FIFO, average cost, specific costs, etc.) are ratio estimates developed from the ASM in conjunction with the census universe estimate for the total of the non-LIFO methods.

QUALIFICATIONS OF THE DATA

The estimates developed from the sample are apt to differ somewhat from the results of a survey covering all companies in the sampled lists but otherwise conducted under essentially the same conditions as the actual sample survey. The estimates of the magnitude of the sampling errors (the differences between the estimates obtained and the results theoretically obtained from a comparable, complete-coverage survey) are provided by the standard errors of the estimates.

The particular sample selected for the ASM is one of a large number of similar probability samples that, by chance, might have been selected under the same specifications. Each of the possible samples would yield somewhat different sets of results, and the standard errors are measures of the variation of all the possible sample estimates around the theoretical, comparable, complete-coverage values.

Estimates of the standard errors have been computed from the sample data for selected statistics in this report. Except for table 3c, they are presented in the form of relative standard errors, the standard errors divided by the estimated values to which they refer. In table 3c, "absolute" standard errors of the estimates are presented.

In conjunction with its associated estimate, the relative standard error may be used to define confidence intervals (ranges that would include the comparable, complete-coverage value for specified percentages of all the possible samples).

The complete coverage value would be included in the range:

1. From one standard error below to one standard error above the derived estimate for about two-thirds of all possible samples.

2. From two standard errors below to two standard errors above the derived estimate for about 19 out of 20 of all possible samples.
3. From three standard errors below to three standard errors above the derived estimate for nearly all samples.

An inference that the comparable, complete-survey result would be within the indicated ranges would be correct in approximately the relative frequencies shown. Those proportions, therefore, may be interpreted as defining the confidence that the estimates from a particular sample would differ from complete-coverage results by as much as one, two, or three standard errors, respectively.

For example, suppose an estimated total is shown as 50,000 with an associated relative standard error of 2 percent, that is, a standard error of 1,000 (2 percent of 50,000). There is approximately 67 percent confidence that the interval 49,000 to 51,000 includes the complete-coverage total and about 95 percent confidence that the interval 48,000 to 52,000 includes the complete-coverage total.

In addition to the sample errors, the estimates are subject to various response and operational errors: errors of collection, reporting, coding, transcription, imputation for nonresponse, etc. These operational errors would also occur if a complete canvass were to be conducted under the same conditions as the survey.

Explicit measures of their effects generally are not available. However, it is believed that most of the important operational errors were detected and corrected in the course of the Bureau's review of the data for reasonableness and consistency. The small operational errors usually remain. To some extent, they are compensating in the aggregated totals shown. When important operational errors were detected too late to correct the estimates, the data were suppressed or were specifically qualified in the tables.

As derived, the estimated standard errors included part of the effect of the operational errors. The total errors, which depend upon the joint effect of the sampling and operational errors, are usually of the order of size indicated by the standard error, or only moderately higher. However, for particular estimates, the total error may considerably exceed the standard errors shown.

The concept of complete coverage under the conditions prevailing for the ASM is not identical to the complete coverage of the census of manufactures, as the censuses have been conducted. Nearly all types of operational errors that affect the ASM also occur in the censuses. The ASM and the censuses, are conducted under quite different conditions, and operational errors can be better controlled in the ASM than in the censuses. As a result, for many of the census figures, the errors are of the same order of size as the total errors of the corresponding annual survey estimates. The differences between the census and ASM operating conditions also disturb, to some degree, the comparability of the ASM and census data.

Any figures shown in the tables in this publication having an associated standard error exceeding 15 percent may be of limited reliability. However, the figure may be combined with higher-level totals, creating a broader aggregate, which then may be of acceptable reliability.

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